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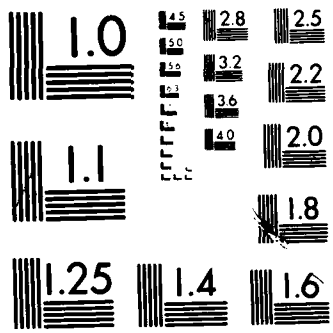

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Prepared by
Division of Archeological Research
Department of Anthropology, University of Nebraska
Technical Report Number 83-04

Archeological Investigations within Federal Lands Located on the east bank of the Lake Sharpe Project Area, South Dakota: 1978-1979 Final Report

Volume III

Appendix 1
Contributing Reports I-O

Appendix 2
Scope of Work, Amendment P00001

US Army Corps
of Engineers
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Class III cultural resources investigations of all Federal lands along the east (left) bank of Lake Sharpe, South Dakota were carried out in 1978-1979 by the University of Nebraska for the U.S. Army Corps of Engineers, Omaha District. A total of 136 sites were investigated, including both prehistoric (n=92) and historic (n=59) components. Historic components represent both Native American and Euroamerican use of the project area. Plains Village period remains (n=49) make up a majority of the prehistoric components; Plains Woodland period (n=8) and

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20. Abstract (continued from front)

Plains Archaic period (n=4) components are also identified. Resources on both the east and west banks of Lake Sharpe were considered in developing a Multiple Resource Nomination. Four districts were proposed, including a total of 118 sites. Ten individual site nominations were also proposed.

ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

VOLUME III

APPENDIX 1

CONTRIBUTING REPORTS

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APPENDIX 2

SCOPE-OF-WORK

TECHNICAL REPORT NO. 83-04

Division of Archeological Research
Department of Anthropology
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Lincoln

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VOLUME III
APPENDIX 1

ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

SECTION I

NOTES ON PREHISTORIC LITHIC RESOURCE UTILIZATION IN THE LAKE SHARPE AREA

by

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ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

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APPENDIX 1, SECTION I

NOTES ON PREHISTORIC LITHIC RESOURCE UTILIZATION IN THE LAKE SHARPE AREA

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INTRODUCTION

Studies of raw material utilization have proven useful in delineating patterns of lithic resource exploitation among and between archeological taxonomic units (e.g., traditions, patterns, variants, complexes, phases, etc.). For example, research by Lehmer (1954) and, more recently, by Ahler (1975a, 1975b, 1977; Ahler et al. n.d.) has demonstrated differing patterns of lithic exploitation between Plains Village pattern units within the Middle Missouri subarea. It is the intent here to expand upon past work, particularly that of Ahler; the focus is within the Lake Sharpe (Big Bend) area of the Middle Missouri subarea. Patterns of lithic resource utilization between Plains Archaic tradition, Plains Woodland tradition and Plains Village pattern assemblages will be explored, in addition to comparisons between variants of the Plains Village pattern. The goal of this research is to contribute to an understanding of culturally conditioned or restricted selections, territoriality, cultural contacts, and trade or redistribution systems of these archeological units. Understanding these cultural elements is important in developing an understanding of overall resource exploitation patterns.

This study involves only chipped stone resource utilization. Ground stone resources are not considered, although some local sources of ground stone tool materials are identified. The data used in this study were generated from materials recovered by the 1978-1979 University of Nebraska-Lincoln, Division of Archeological Research investigations within the Lake Sharpe Project area.

PROBLEM DEFINITION AND METHODS

According to Ahler (et al.n.d.), two problems are relevant to the comprehensive analysis of lithic raw materials:

(1) identifying a geologically and petrographically meaningful classification of lithic materials present, and

(2) determining the distribution and nature of source areas for each raw material in order to elucidate patterns of selection, procurement, and utilization techniques.

Much of this basic work has been accomplished for the Middle Missouri subarea by Ahler (1975b: Appendix D, 1977; Ahler et al. n.d.). Of particular importance to this study is recent analysis of lithic raw materials and sources for the Medicine Crow site complex (39BF2), located within the Lake Sharpe Project area (Ahler et al. n.d.). These studies will be drawn upon to aid in resolving the two problems stated above. In addition, numerous lithic samples, taken from the Missouri River terrace gravels during the course of survey and evaluation work, are used to more fully evaluate locally available materials.

In the present context, raw material type analysis consisted of comparing archeological specimens to examples contained in a lithic raw material type collection, thereby arriving at an assessment of the material the artifact was derived from. In this study the chipped stone sample from each component is treated as a unit. Relative frequencies (percentages) of lithic raw material types are recorded within each component. Raw material type breakdowns are not provided separately for tool classes or flaking debris.

Because some error was anticipated in the purely visual analytic technique employed, some replication was carried out during the course of study. The few inconsistencies noted were not considered to be a significant factor in the overall interpretation.

Other sources of error may exist in the assessment of locally available materials through the use of the limited terrace gravel collections. It is felt that lithic samples taken from the MT-2 gravels are generally representative of material types present in this terrace system, but may not be representative of materials present in other terraces not sampled. The lower river terraces (MT-0 and MT-1) are for the most part inundated and unavailable for study.

These terraces may have contained lithic materials different from those in MT-2 that would have been available for Native exploitation. Additionally, higher river terraces (MT-3) and the land surface back from the Missouri Trench (the Missouri Coteau and Coteau Slope) may also contain materials not evaluated by this study. Moreover, all local gravel samples were taken from the east side of the project area. No collections were made along the west shore. It is possible that some raw materials present along the western margin of Lake Sharpe are not present along the eastern shore. However, given the cut-and-fill structure of the Missouri terraces in this area (see Coogan and Irving 1959; Coogan, this report), and the homogenous nature of the deposits in the glaciated uplands, it seems unlikely that these potential sources of error would be significant.

SAMPLE SELECTION

Three criteria were applied in selecting components to be used in this study. First, a count of at least 100 chipped stone specimens was required before a component sample was considered potentially usable. It was believed that use of this minimum arbitrary figure would provide approximately the total range of variation within each assemblage. Second, all samples were selected from either single component occupations, or multicomponent occupations where there was reasonable separation between components. All loci not meeting these tests were excluded from further consideration. Another requirement for Plains Village pattern components was that samples be from a main village area--not a temporary camp or activity site only marginally related to the village occupation. This additional consideration was thought necessary to eliminate extraneous variability that might occur at sites or activities areas not representing a primary habitation locus.

Based upon the application of these criteria, nine components from seven sites were selected for inclusion in this study. These components represent the Plains Archaic and Woodland traditions and

the Initial, Extended and Post-Contact variants of the Coalescent tradition (Table I-1).

No Middle Missouri tradition sites meet the stated criteria and none are included. A fundamental assumption that underlies this study is that the lithic raw material types present in the samples selected for analysis are representative of the total range of lithic resources utilized at each loci. This assumption has no direct empirical basis and may not be valid in all cases.

Finally, it must be noted that this study is not meant to be a comprehensive analysis of lithic resource utilization patterns in the Lake Sharpe area. Rather, I merely wish to present some observations on lithic resource utilization in the Lake Sharpe area, backed up by research in this area over the past few years. Furthermore, I hope to suggest what these observations might mean in terms of more general exploitation patterns for those archeological units that have been identified in this portion of the Middle Missouri subarea.

LITHIC RESOURCES

For the purposes of this study, specific lithic raw material types have been divided into three resource groups and discussed accordingly: 1) local resources, those available in the Lake Sharpe area; 2) non-local subarea resources, those only available outside the Lake Sharpe area, but still available within the confines of the Middle Missouri subarea; and 3) non-local non-subarea resources, those only available beyond the confines of the Middle Missouri subarea.

LOCAL RESOURCES

The definition and delimitation of locally available lithic raw materials is based on the work of Ahler (1977) and Ahler et al. (n.d.) and analysis of lithic collections taken from the MT-2 gravels along the east bank of Lake Sharpe. Ten locally available chipped stone raw

Table I-1. Lithic samples included in the present study.

Site Name (Number)	Component(s)[a]
Diamond-J (39HU89)	Plains Archaic Tradition Plains Woodland Tradition
Rousseau (39HU102)	Plains Archaic Tradition Plains Woodland Tradition
Little Elk (39HU221)	Plains Woodland Tradition
Whistling Elk (39HU242)	Coalescent Tradition, Initial Coalescent Variant
Little Pumpkin (39HU97)	Coalescent Tradition, Extended Coalescent Variant
Standing Bull (39HU214)	Coalescent Tradition, Extended Coalescent Variant
Iron Shooter (39HU217)	Coalescent Tradition, Post-Contact Coalescent Variant

NOTE: These sites are treated in greater detail in Volume II of Appendix 1. See Sections A (39HU242), B (39HU89), C (39HU102), D (39HU221), and F (39HU97, 214, 217).

[a]For a discussion of these taxonomic units in the Middle Missouri subarea see Lehmer (1971) and this report.

material types have been identified: 1) coarse yellow Tongue River silicified sediment, 2) coarse red Tongue River silicified sediment, 3) solid quartzite, 4) porous quartzite, 5) other quartzite, 6) jasper/chert, 7) chalcedony/silicified wood, 8) basaltic materials, 9) quartz and 10) Pierre Shale mudstone. In addition, two ground stone raw material types were also found: 1) granitic materials and 2) gypsum. Each of these materials are discussed below.

COARSE YELLOW TONGUE RIVER SILICIFIED SEDIMENT (TRSS)

This raw material type is a subclass of the more inclusive raw material type TRSS (see Ahler 1977:139; Ahler et al. n.d.). While this material is undoubtedly local to the Lake Sharpe area, it does not occur in the MT-2 gravels in any appreciable frequency. Only one specimen was positively identified in our gravel samples, although several were found by Ahler in the gravels recovered from Medicine Crow.

COARSE RED TONGUE RIVER SILICIFIED SEDIMENT (TRSS)

This material is also a subclass of the more inclusive TRSS raw material type. The coarse red variety of TRSS has been interpreted as a heat treated version of the coarse yellow variety. Ahler's work with the Medicine Crow assemblage suggests that most of the coarse red TRSS was probably brought into the site from elsewhere, rather than having been produced on the site itself. This material must be considered locally available, however, in view of the local availability of the coarse yellow variety from which it is produced. It is of interest to note that no coarse red TRSS was identified in local gravel samples.

SOLID QUARTZITE

This raw material type is described in detail by Ahler (1977: 136-137) and its occurrence in the Lake Sharpe area is discussed in Ahler et al. (n.d.). This material occurs in primary contexts in the Spanish Diggings quarries of Wyoming and other locations in the

Black Hills of southwest South Dakota. It also occurs in secondary contexts as cobble outcroppings in the Big Badlands of southwestern South Dakota. Solid quartzite material also frequently occurs in the Lake Sharpe area as reworked, secondary alluvial deposits of cobbles in the MT-2 fill, as Ahler's work at Medicine Crow and our lithic samples indicate. It is Ahler's opinion that solid quartzite was introduced into the Lake Sharpe area by fluvial transport down the Bad and Cheyenne Rivers which drain the primary and secondary source areas to the west.

POROUS QUARTZITE

This quartzite is described in detail in Ahler (1977:139) and Ahler et al. (n.d.). It is apparently the same stone that is referred to as Swan River chert in Manitoba. According to Ahler, it is a glacially transported rock derived from deposits somewhere to the northeast of the Lake Sharpe area. Porous quartzite is available in the MT-2 gravels of the Lake Sharpe area in limited quantities, as Ahler's work at Medicine Crow and our samples indicate.

OTHER QUARTZITE

This raw material type is defined here to include all coarse grained, locally available quartzites found in our gravel samples that did not seem to fit the descriptions of either the solid or porous quartzite types. Porous quartzite is a distinctive stone type, with great heterogeneity in grain size and small vugs or cavities,often lined with quartz crystals (Ahler 1977:139). Solid quartzites are defined as having a medium to fine grained, homogeneous texture (Ahler 1977:136-137). Some quartzites which occur frequently in the local gravel samples were generally coarse grained, heterogenous in texture, without vugs, and not strictly definable as the porous or solid varieties. To accommodate these materials, the new raw material type was defined.

Other quartzites are variable in color, generally coarse grained and heterogenous in texture. They occur quite frequently in the MT-2

gravels of the Lake Sharpe area, but were not frequently used for chipped stone tool manufacture. Locally available solid and porous quartzite varieties were used more frequently for this purpose. The infrequent use of other quartzites by prehistoric peoples probably reflects its very poor fracture properties. For this reason the category "other quartzites" did not prove useful as an analytical unit and can probably be best subsumed under solid quartzites in future studies.

JASPER/CHERT

This raw material class was originally defined by Ahler (1975b: 94-98) to include all opaque, medium to fine grained, silicious cherty stones from archeological assemblages in the Mobridge, South Dakota area. It was subsequently equated with Chadron chert derived from secondary sources in the Big Badlands of South Dakota for the Mobridge area studies (Ahler 1977:134). This raw material class was reevaluated for the Medicine Crow study and was once again redefined as a broad array of lithic materials locally available in the Lake Sharpe area, not strictly equatable with Chadron Chert (Ahler et al. n.d.). Ahler's work at Medicine Crow and our gravel samples show that a wide variety of cherts and jaspers are very common in the Lake Sharpe area.

CHALCEDONY/SILICIFIED WOOD

This raw material class includes all clear or grey chalcedonies, yellow or light brown chalcedonies, dark brown chalcedonies, burnt chalcedonies and silicified woods as defined in Ahler (1975b:99-101, 103) and discussed for the Lake Sharpe area (Ahler et al. n.d.). All of these chalcedonic materials have been grouped under the chalcedony/ silicified wood class as in Ahler (1977:138-139). Chalcedonies are not particularly common in the MT-2 gravels in the Lake Sharpe area, as Ahler's work at Medicine Crow and our local samples indicate. This locally available material was actively sought, however, as the relatively high number of artifacts made from the material shows. Most chalcedonies and silicified woods occurring in the Lake Sharpe area are pebble size. Chalcedonies recovered from lithic samples are

predominantly clear or grey in color and plate-like in form, resembling the non-local raw material type plate chalcedony discussed below, but easily distinguished from this non-local type. In his work at Medicine Crow, Ahler (Ahler et al. n.d.) notes that most of the clear grey chalcedonies from local gravels are "actually highly weathered, waterworn fragments of the stone type plate chalcedony." He also states that little difficulty was encountered in separating local plate-like chalcedony from the non-local plate chalcedony type.

Another consideration that requires comment under the raw material class chalcedony is the distinction between dark brown chalcedony and Knife River flint (see Ahler 1977:138; Ahler et al. n.d.), which is also chalcedonic and dark brown in color. Ahler (Ahler et al. n.d.) prefers to place all dark brown chalcedonic materials not readily apparent as Knife River flint in a dark brown chalcedony raw material type. Our observations on the local gravels failed to reveal a single piece of dark brown chalcedony (or Knife River flint proper), so we have elected to place all dark brown chalcedonic materials in the non-local Knife River flint category. Based on his analysis of the Medicine Crow assemblage, Ahler has concluded that Knife River flint may be locally available in the Lake Sharpe area as small water transported pebbles. Our analysis of the local gravels differs on this point: no Knife River flint was present in our local gravel samples and we have chosen to treat Knife River flint as a non-local resource.

BASALTIC MATERIALS

All dense, dark colored, fine grained igneous or metamorphic stones are referred to as basaltic. These are described in detail in Ahler (1977:139) and Ahler et al. (n.d.). They are common in the Lake Sharpe area today, although their utilization in the manufacture of chipped stone tools was limited to mostly larger, crude bifacial implements and core tools. Basaltic materials were also used in the manufacture of ground stone implements.

QUARTZ

This locally available raw material type is also described in detail in Ahler (1977:139) and Ahler et al. (n.d.). Quartzes of varying colors are very common in the MT-2 gravels. Little use was made of this material for the manufacture of chipped stone tools. The quartz technology at Medicine Crow was very crude and its sole purpose appeared to be the production of implements with very hard, sharp edges (Ahler et al. n.d.).

PIERRE SHALE MUDSTONE

This raw material type was not identified by Ahler. Mudstone has a restricted distribution in the Lake Sharpe area, with primary sources located in the Pierre shale exposures in the Badlands or "Missouri Breaks" of the Big Bend of the Missouri River and possibly other Pierre Shale exposures. The material is composed of cemented clay particles or mud and its formation is directly related to that of Pierre Shale. It appears as a thick, blocky shale-like rock interspersed with true shales. Color ranges from a light to dark tan. The cortex is shale-like in appearance, black to dark brown, sometimes partially rust-colored or with rust-colored streaks. The material is very fine grained and homogeneous, and exhibits a good conchoidal fracture with sharp edges. Freshly fractured pieces have a dull luster. Use of this material in the manufacture of chipped stone tools is not known outside the primary source area. Within the primary source area, only a very few specimens were noted in archeological contexts or collections. The infrequent use as a tool is probably the result of the material's relative softness and inability to hold a sharp edge.

GRANITIC MATERIALS

Granitic rocks are common in the Lake Sharpe area where they occur as glacially transported cobbles and boulders (see Ahler et al. n.d.). Granitic materials were frequently used in cobble and ground stone tool manufacture and are reported as fire-cracked rock.

GYPSUM

This material is commonly found in the vicinity of Fort Thompson, South Dakota, particularly at the mouth of Soldier Creek and in the Pierre Shale exposures in the Badlands of the Big Bend. Gypsum was sometimes used by Plains Village peoples in the manufacture of non-utilitarian and ornamental ground stone objects.

NON-LOCAL SUBAREA RESOURCES

The definition and delimitation of lithic materials not locally available in the Lake Sharpe area, but available within the Middle Missouri subarea, are also based upon the work of Ahler (1977) and Ahler et al. (n.d.), as well as the analysis of lithic collections taken from the MT-2 gravels along the east bank of Lake Sharpe. Four lithic resources present within the confines of the Middle Missouri subarea but not present in the Lake Sharpe area have been identified: 1) smooth grey Tongue River silicified sediment, 2) Bijou Hills silicified sediment, 3) Knife River flint and 4) porcellanite.

SMOOTH GREY TONGUE RIVER SILICIFIED SEDIMENT

This raw material type is also a subclass of the more inclusive TRSS (see Ahler 1977:137; Ahler et al. n.d.). The primary source area for this material is in north-central South Dakota and south-central North Dakota west of the Missouri River (Ahler 1977: Figure 1). Ahler's analysis of chipped stone artifacts from Medicine Crow led to the conclusion that this raw material might be represented in the MT-2 gravels in the Lake Sharpe area, although none were identified in his sample. No definite smooth grey Tongue River silicified sediment was found in our gravel samples however, although some fine grained, grey colored cherts were noted. The cherts lacked the distinctive fossil plant inclusions. Based on available information this material is considered to be unavailable in the Lake Sharpe area, but available within the larger Middle Missouri subarea.

BIJOU HILLS SILICIFIED SEDIMENT

This material, sometimes referred to as a quartzite, is described in detail in Ahler (1977:137-138). Primary sources of this material are located to the north and south of the Lake Sharpe area, within the Middle Missouri subarea (Ahler 1977: Figure 1). The source nearest to the Lake Sharpe area is in the Bijou and Iona Hills some 40 mi. down stream from Medicine Crow (Ahler et al. n.d.).

KNIFE RIVER FLINT

This distinctive material is also described in detail in Ahler (1977:138). The primary source location is the extensive aboriginal quarries in Dunn and Mercer Counties, North Dakota (Ahler 1977: Figure 1). Small pieces of this material are also found in alluvial terrace deposits west of, and along, the Missouri River as far south as Mobridge, South Dakota (Ahler 1977:138). Work with the Medicine Crow assemblage has led to the conclusion that small amounts of Knife River flint are available locally in the Lake Sharpe area, although samples of local gravels contained no examples (Ahler et al. n.d.). Our local gravel samples did not contain Knife River flint either, nor did they contain anything remotely resembling it (i.e., dark brown chalcedonic materials). We consider Knife River flint to be a non-local lithic resource, available within the Middle Missouri subarea, but not within the Lake Sharpe area.

PORCELLANITE

This non-local raw material is not described by Ahler (1977), although it is described in detail in Ahler et al. (n.d.) and by Fredlund (1976). The nearest primary source area would be far to the west and north of the Lake Sharpe area, in northeastern Wyoming, northwestern South Dakota, eastern Montana and western North Dakota (Ahler et al. n.d.). Recent archeological investigations in western North Dakota, by the University of North Dakota (Northern Border Pipeline Project) indicate that porcellanite is available in that portion of the state.

NON-LOCAL NON-SUBAREA RESOURCES

Ahler (1977), Ahler et al. (n.d.) and our analysis of local gravel samples indicate that only two lithic raw material types commonly found in Middle Missouri sites may be considered non-local to both the Lake Sharpe area and the Middle Missouri subarea: 1) flattop chalcedony and 2) plate chalcedony.

FLATTOP CHALCEDONY

This raw material type is described in detail in Ahler (1977: 134-135). The material occurs in outcroppings over a wide area of western Nebraska, eastern Colorado and southwestern South Dakota (Ahler 1977: Figure 1). While this material could have been transported into the Lake Sharpe area by the Bad and Cheyenne rivers, work with the Medicine Crow collection indicates that this was not the case (Ahler et al. n.d.). Analysis of local gravel samples does not contradict Ahler's interpretation: Flattop chalcedony is non-local to the Lake Sharpe area.

PLATE CHALCEDONY

This distinctive material is described in detail in Ahler (1977:136) and is found in primary context in the badlands of southwestern South Dakota and northwestern Nebraska (Ahler 1977: Figure 1). Analysis of the Medicine Crow assemblage indicates this as does our analysis of local gravels. As discussed above, small weathered pebbles of this material, or other plate-like chalcedonies, do occur locally, but are easily distinguished from non-local specimens.

ANALYSIS OF RECOVERED MATERIALS

PLAINS ARCHAIC TRADITION

Two sites with identified Plains Archaic tradition components were selected for use in this study: 1) Diamond-J (39HU89) and

2) Rousseau (39HU102). The chipped stone sample from the Archaic component at Diamond-J was recovered from a 2x2m excavation (tests, 1, 4, 5 and 6). The Archaic cultural horizon was located from 80-90 to 140cm below the surface. Other test excavations were completed at Diamond-J, but are not considered here. The sample from the Rousseau Archaic component(s) was recovered from several test excavations (tests 1 and 2, bank profiles 2 and 3). Depths of the Archaic cultural horizon at Rousseau varied considerably within these tests, but generally were from 70 to 190cm below the surface. Additional test excavations were completed at Rousseau, but are not included in this study.

A total of 3292 pieces of chipped stone material from these two Archaic components was classified by lithic raw material type (Table I-2). Both sites exhibit an extremely high level of local lithic resource utilization; the Diamond-J sample contains 92.9% local materials and the Rousseau sample contains 95.7% local materials. Some differences are evident between the two components in the relative frequency of occurrence of local materials. These differences are not seen as indicative of preference, but rather, as reflecting discrete chipping episodes focusing on one or more local raw materials.

Non-local subarea materials are not common at either site, comprising only 7.0% of the Diamond-J sample and only 3.8% of the Rousseau sample. At Diamond-J, most of the non-local subarea materials consist of smooth grey TRSS (5.3%) and Knife River flint (1.6%). Non-local subarea materials present at Rousseau consist mainly of Knife River flint (3.2%). Both of these non-local subarea materials are available in the northern portion of the Middle Missouri subarea in north-central South Dakota and south-central North Dakota (Ahler 1977: Figure 1).

Non-local non-subarea materials were identified only at Rousseau and consist of a minute amount of possible Flattop chalcedony. The presence of 0.5% of Flattop chalcedony at Rousseau is too small to be considered of importance and may reflect a classification error, rather than the actual presence of this material in the sample.

Table I-2. Chipped stone artifacts by raw material type, Plains Archaic tradition components.

Raw Material Type		Diamond-J (39HU89)	Rousseau (39HU102)	Total
Local				
Coarse Yellow TRSS	n	4	26	30
	%	0.2	2.2	0.9
Coarse Red TRSS	n	16	11	27
	%	0.8	0.9	0.8
Solid Quartzite	n	319	85	404
	%	15.0	7.3	12.3
Porous Quartzite	n	6	3	9
	%	0.3	0.3	0.3
Other Quartzite	n	39	4	43
	%	1.8	0.3	1.3
Jasper/Chert	n	864	290	1154
	%	40.8	24.7	35.1
Chalcedony/Silicified Wood	n	685	635	1320
	%	32.3	54.2	40.1
Basaltic	n	3	11	14
	%	0.1	0.9	0.4
Quartz	n	5	22	27
	%	0.2	1.9	0.8
Pierre Shale Mudstone	n	29	35	64
	%	1.4	3.0	1.9
Subtotal	n	1970	1122	3092
	%	92.9	95.7	93.9
Non-Local Subarea				
Smooth Grey TRSS	n	113	2	115
	%	5.3	0.2	3.5
Bijou Hills Silicified Sediment	n	1	4	5
	%	0.1	0.3	0.2
Knife River Flint	n	33	38	71
	%	1.6	3.2	2.3
Porcellanite	n	3	0	3
	%	0.1	0.0	0.1
Subtotal	n	150	44	194
	%	7.0	3.8	6.3
Non-Local Non-Subarea				
Flattop Chalcedony	n	0	6	6
	%	0.0	0.5	0.2
Plate Chalcedony	n	0	0	0
	%	0.0	0.0	0.0
Subtotal	n	0	6	6
	%	0.0	0.5	0.2
Total	n	2120	1172	3292
	%	100	100	100

These data suggest that Plains Archaic peoples who occupied the Lake Sharpe area did not utilize non-local lithic resources to any great extent. Rather the data indicate that Archaic peoples in the Lake Sharpe area used locally available raw materials generally present within a few miles of the occupation sites. The only substantial use of non-local raw materials is reflected by recovered smooth grey Tongue River silicified sediment and Knife River flint. These materials are available in quantity within the confines of the Middle Missouri subarea to the north of the Lake Sharpe area, and may be available locally in small amounts (see Ahler et al. n.d.).

Caution must be used in drawing broad conclusions from these small data sets, but preliminary results are interesting. Extrapolating these data may suggest that territoriality, cultural contacts, and trade for Plains Archaic peoples in the Lake Sharpe area did not extend much beyond this locale, certainly not beyond the northern part of the Middle Missouri subarea. It may be hypothesized that Plains Archaic populations in the Lake Sharpe area limited resource exploitation to the immediate area while in residence. It may be further hypothesized that the Plains Archaic cultures of the Middle Missouri subarea were locally oriented and endemic.

PLAINS WOODLAND TRADITION

Three Plains Woodland tradition components are included here: 1) Diamond-J (39HU89), 2) Rousseau (39HU102) and 3) Little Elk (39HU221). The Woodland component chipped stone sample from Diamond-J is restricted to materials from a 2x2m unit (tests 1, 4, 5 and 6). The Woodland cultural horizon extended from 0 to 60-70cm below the surface. Other test excavations completed at Diamond-J are not considered. The Woodland sample from Rousseau was recovered from three test excavations (tests 1 and 2, bank profile 3). The Woodland cultural horizon at Rousseau was generally located from 40-60 to 70cm below the surface in these units. Other tests at Rousseau are not used in this study. The Little Elk Woodland

materials are from a single test excavation (bank profile 1); the Woodland horizon extends from 110 to 165cm below the surface.

A total of 4941 chipped stone items from these three Woodland components were classified by lithic raw material type (Table I-3). All three components exhibit a predominance of local resource use. The Diamond-J sample contains 95.6% local materials; the Rousseau sample contains 82.9% local materials and the Little Elk sample contains 96.5% local materials. The relative frequencies of locally available materials differ somewhat between the three Woodland components. As with the Archaic components, these differences are believed to represent discrete chipping episodes focused on one or more local raw materials, rather than actual resource preference. For example the relatively high percentage of porous quartzite (19.0%) at Diamond-J reflects materials found in a single concentration representing the reduction of one or more porous quartzite cores.

At Diamond-J non-local subarea materials comprise only 4.4% of the sample, at Little Elk they comprise only 3.5% of the sample, but at Rousseau these materials comprise fully 15.4% of the sample. Most of the non-local subarea materials at Rousseau consist of Bijou Hills silicified sediment (13.4%). This material is available to both the north and south of the Lake Sharpe area within the confines of the Middle Missouri subarea (Ahler 1977: Figure 1). The Diamond-J sample shows the greatest diversity in non-local subarea materials - smooth grey TRSS (1.6%), Bijou Hills silicified sediment (0.2%), Knife River flint (1.5%) and porcellanite (1.0%) - but the frequency of occurence is low. The only non-local subarea material present at Little Elk is a small amount of Knife River flint (3.5%). All of these non-local subarea materials are present to the north of the Lake Sharpe area in the northern portion of the Middle Missouri subarea (Ahler 1977: Figure 1).

Non-local non-subarea materials are infrequent. These observations may represent classification error rather than actual usage of these materials.

Table I-3. Chipped stone artifacts by raw material type, Plains Woodland tradition components.

Raw Material Type		Diamond-J (39HU89)	Rousseau (39HU102)	Little Elk (39HU221)	Total
Local					
Coarse Yellow TRSS	n	6	0	0	6
	%	0.1	0.0	0.0	0.1
Coarse Red TRSS	n	95	8	0	103
	%	2.1	3.3	0.0	2.1
Solid Quartzite	n	313	22	2	337
	%	6.9	8.9	1.4	6.8
Porous Quartzite	n	864	0	6	870
	%	19.0	0.0	4.2	17.6
Other Quartzite	n	43	4	8	55
	%	0.9	1.6	5.6	1.1
Jasper/Chert	n	1612	80	21	1713
	%	35.4	32.5	14.7	34.7
Chalcedony/Silicified Wood	n	1325	77	8	1410
	%	29.1	31.3	5.6	28.5
Basaltic	n	13	2	24	39
	%	0.3	0.8	16.8	0.8
Quartz	n	12	10	69	91
	%	0.3	4.1	48.3	1.8
Pierre Shale Mudstone	n	67	1	0	68
	%	1.5	0.4	0.0	1.4
Subtotal	n	4350	204	138	4692
	%	95.6	82.9	96.5	95.0
Non-Local Subarea					
Smooth Grey TRSS	n	74	1	0	75
	%	1.6	0.4	0.0	1.5
Bijou Hills Silicified Sediment	n	11	33	0	44
	%	0.2	13.4	0.0	0.9
Knife River Flint	n	67	4	5	76
	%	1.5	1.6	3.5	1.5
Porcellanite	n	47	0	0	47
	%	1.0	0.0	0.0	1.0
Subtotal	n	199	38	5	242
	%	4.4	15.4	3.5	4.9
Non-Local Non-Subarea					
Flattop Chalcedony	n	3	4	0	7
	%	0.1	1.6	0.0	0.1
Plate Chalcedony	n	0	0	0	0
	%	0.0	0.0	0.0	0.0
Subtotal	n	3	4	0	7
	%	0.1	1.6	0.0	0.1
Total	n	4552	246	143	4941
	%	100	100	100	100

These data suggest that Plains Woodland groups who occupied the Lake Sharpe area, like the earlier Plains Archaic peoples, made primary use of local lithic resources. An exception is noted at the Rousseau site where a relatively high proportion of Bijou Hills silicified sediment is evident (13.4%). There is no clear evidence that non-local raw materials from outside of the Middle Missouri subarea were used.

Again, caution must be used in drawing broad conclusions from these data. Extrapolating from this tentative resource use pattern, however, it may be suggested that Woodland tradition contacts and/or trade did not extend much beyond this locale, certainly not beyond the Middle Missouri subarea. It may be further suggested that the Plains Woodland cultures of the Middle Missouri subarea were locally oriented and endemic, like their Archaic predecessors.

PLAINS VILLAGE PATTERN, COALESCENT TRADITION

Four sites with identified Plains Village pattern, Coalescent tradition components were selected for inclusion in this study: 1) Whistling Elk (39HU242), assigned to the Initial Coalescent variant; 2) Little Pumpkin (39HU97) and 3) Standing Bull (39HU214), assigned to the Extended Coalescent variant; and 4) Iron Shooter (39HU217), assigned to the Post-Contact Coalescent variant. The Iron Shooter sample also includes an Extended Coalescent variant component that is not considered here.

The chipped stone sample from Whistling Elk was recovered from two partially intact earthlodges exposed in the bank of Lake Sharpe. The large volume of material from Whistling Elk precluded complete analysis of the chipped stone assemblage in the context of the present project. In order to reduce the chipped stone sample, a 25% random sample (n=3057) of all complete excavation units was chosen for use in this study. A second sample (n=273) consisting of three chipped stone caches found in small "pocket" cache pits beneath the floors of the earthlodges and two chipped stone concentrations found on the earthlodge floors were also selected. The two samples exhibit the same pattern of raw material use and are treated as an aggregate in this analysis.

The sample from Little Pumpkin consists primarily of chipped stone artifacts recovered through extensive surface collection, and of materials recovered from the salvage excavation of a partial cache pit found eroding from the lake bank. The Standing Bull sample was obtained through surface collection of the cultivated site area. The Iron Shooter sample was recovered through the salvage excavation of midden deposits that were found eroding from a fortification ditch, partially exposed in the bank of Lake Sharpe.

A total of 5209 chipped stone artifacts from the four components was classified according to lithic raw material type (Table 1-4). A review of percentage subtotals for each group of materials reveals some variation between the four components and the three variants they represent. At Whistling Elk 4.6% of the chipped stone sample was manufactured from local materials, while at Little Pumpkin this figure is 65.9%. Local materials from Standing Bull total 79.6% and 77.7% at Iron Shooter. Thus the Whistling Elk data show a low proportion of local material utilization, while the other three site samples reveal substantial levels of local resource utilization.

When non-local subarea materials are considered, Whistling Elk reveals a very low relative frequency of these materials (0.8%), as does the Iron Shooter sample (1.9%). The Little Pumpkin and Standing Bull samples, however, contain substantial amounts of non-local subarea materials--15.2% and 12.5% respectively.

Non-local non-subarea materials are present in the Whistling Elk sample in high proportion (94.6%), making-up almost the entire sample. The next highest level of utilization of non-local non-subarea materials occurs at Iron Shooter (20.4%), followed by Little Pumpkin (18.9%) and Standing Bull (7.9%). Non-local non-subarea materials were used in substantial quantities at all four sites, but relative levels of utilization vary markedly.

Obviously, considerable variation in raw material utilization is evident between the four samples and in particular between Whistling Elk and the other components. This variation may suggest that variation in raw material utilization exists between the three

Table I-4. Chipped stone artifacts by raw material type, Plains Village pattern components, Initial Coalescent variant (39HU242), Extended Coalescent variant (39HU97 and 39HU214), Post-Contact Coalescent variant (39HU217).

Raw Material Type		Whistling Elk (39HU242)	Little Pumpkin (39HU97)	Standing Bull (39HU214)	Iron Shooter (39HU217)	Total
Local						
Coarse Yellow TRSS	n	7	9	12	2	30
	%	0.2	1.3	2.8	0.2	0.6
Coarse Red TRSS	n	6	25	14	15	60
	%	0.2	3.5	3.2	2.0	1.2
Solid Quartzite	n	58	59	37	34	188
	%	1.7	8.3	8.6	4.6	3.6
Porous Quartzite	n	9	19	29	7	64
	%	0.3	2.7	6.7	1.0	1.2
Other Quartzite	n	1	9	9	5	24
	%	0.1	1.3	2.1	0.7	0.5
Jasper/Chert	n	42	164	130	290	626
	%	1.3	23.0	30.1	39.6	12.0
Chalcedony/Silicified Wood	n	25	105	51	179	360
	%	0.8	14.7	11.8	24.5	6.9
Basaltic	n	2	56	60	7	125
	%	0.1	7.8	13.9	1.0	2.4
Quartz	n	2	22	2	30	56
	%	0.1	3.1	0.5	4.1	1.1
Pierre Shale Mudstone	n	1	3	0	0	4
	%	0.1	0.4	0.0	0.0	0.1
Subtotal	n	153	471	344	569	1537
	%	4.6	65.9	79.6	77.7	29.5
Non-Local Subarea						
Smooth Grey TRSS	n	8	52	6	7	73
	%	0.2	7.3	1.4	1.0	1.4
Bijou Hills Silicified Sediment	n	18	47	41	5	111
	%	0.5	6.6	9.5	0.7	2.1
Knife River Flint	n	1	10	5	2	18
	%	0.1	1.4	1.2	0.3	0.3
Porcellanite	n	0	0	2	0	2
	%	0.0	0.0	0.5	0.0	0.1
Subtotal	n	27	109	54	14	204
	%	0.8	15.2	12.5	1.9	3.9

Table I-4. Chipped stone artifacts by raw material type, Plains Village pattern components, Initial Coalescent variant (39HU242), Extended Coalescent variant (39HU97 and 39HU214), Post-Contact Coalescent variant (39HU217) (concluded).

Raw Material Type		Whistling Elk (39HU242)	Little Pumpkin (39HU97)	Standing Bull (39HU214)	Iron Shooter (39HU217)	Total
Non-Local Non-Subarea						
Flattop Chalcedony	n	2946	83	20	77	3126
	%	88.5	11.6	4.6	10.5	60.0
Plate Chalcedony	n	204	52	14	72	342
	%	6.1	7.3	3.2	9.8	6.6
Subtotal	n	3150	135	34	149	3468
	%	94.6	18.9	7.9	20.4	66.6
Total	n	3330	715	432	732	5209
	%	100	100	100	100	100

defined variants of the Coalescent tradition under study. In order to explore this variation further, each site and variant is discussed separately.

INITIAL COALESCENT VARIANT

The Whistling Elk (39HU242) data show a major use of non-local non-subarea materials for the Initial Coalescent variant occupation (see Table I-4). Flattop Chalcedony exhibits high relative frequency (88.5%). Local materials make up only 4.6% of the total, with non-local subarea materials constituting 0.8%. The nearest known primary source areas for Flattop Chalcedony occur at least 100km to the southwest of the Lake Sharpe area in the White River drainage (Ahler 1977: Figure 1). The next most frequent raw material type, Plate Chalcedony (6.1%), also occurs in the same area.

The pattern of non-local lithic resource utilization cannot be extended to the Initial Coalescent variant as a whole on the basis of data from a single site, but does suggest that Initial Coalescent groups did not restrict resource exploitation to the immediate area or to the Middle Missouri subarea. Rather, these peoples ranged far out onto the Plains, many kilometers to the southwest of their villages, where they secured certain resources. As an alternative explanation, the Whistling Elk data may indicate that Initial Coalescent groups participated in extensive trade networks, linking them to distant sources of lithic raw materials. The existence of such trade systems during the prehistoric period has been discussed by Wood (1974).

Whatever the mechanism whereby these lithic resources were obtained, it seems likely that Initial Coalescent resource exploitation activities, and by inference their contacts and/or trade systems, extended far beyond the Lake Sharpe area and the confines of the Missouri trench -- reaching many kilometers onto the Plains of southwestern South Dakota. This argues that Initial Coalescent cultures did not assume a solely local focus within the Lake Sharpe area. It may be further hypothesized that Initial Coalescent cultures of the Middle Missouri subarea were not locally oriented and endemic, but

were non-locally oriented and pandemic. The apparent non-local aspects of these Plains Village groups is in marked contrast to the apparent local focus of pre-village cultures.

EXTENDED COALESCENT VARIANT

The Extended Coalescent variant samples from Little Pumpkin (39HU97) and Standing Bull (39HU214) exhibit some differences in relative frequencies of lithic raw material types, but on the whole similarities would seem to outweigh differences. A wide range of local and non-local materials is present at each site (Table I-4). This situation contrasts sharply with the pattern at Whistling Elk where lithic resource utilization was focused primarily on two non-local materials available outside the Middle Missouri subarea.

Locally available materials comprised 65.9% of the Little Pumpkin sample and 79.6% of the Standing Bull sample. Non-local subarea materials are present in nearly equivalent proportions in both samples, comprising 15.2% of the Little Pumpkin assemblage and 12.5% of the Standing Bull Assemblage. A difference between individual types is a greater proportion of smooth grey TRSS at Little Pumpkin (7.3%), compared to a negligible amount of this material at Standing Bull (1.4%). Smooth grey TRSS is available in the Middle Missouri subarea ca. 100km north of the Lake Sharpe area (Ahler 1977: Figure 1). Both sites show utilization of Bijou Hills silicified sediment (6.6% at Little Pumpkin and 9.5% at Standing Bull), a material available in the Middle Missouri subarea to the north and south of the Lake Sharpe area (Ahler 1977: Figure 1). Other non-local subarea materials (Knife River flint and porcellanite) are present in negligible amounts. These materials are available in quantity in the Middle Missouri subarea to the north of the Lake Sharpe area, in central and northwestern North Dakota.

Non-local, non-subarea materials are also present. These lithic resources make up 18.9% of the Little Pumpkin sample and 7.9% of the Standing Bull sample. Flattop chalcedony is more common than plate chalcedony.

The samples used in this study suggest a diversified lithic resource use pattern for Extended Coalescent variant. Locally available materials are represented most frequently (average 72.8%), followed by non-local subarea materials (average 13.9%) and non-local, non-subarea materials (average 13.4%). These values indicate that resource exploitation for Extended Coalescent village peoples was not restricted to the Lake Sharpe area alone, but extended over the southern portion of the Middle Missouri subarea and beyond the Middle Missouri subarea into southwestern South Dakota. Further, this implies that Extended Coalescent cultures did not assume a solely local focus within the Middle Missouri subarea and suggests that Extended Coalescent cultures of the Middle Missouri subarea were not only locally oriented and endemic, but were also non-locally oriented and pandemic. This interpretation is similar to that arrived at for the earlier Initial Coalescent variant.

POST-CONTACT COALESCENT VARIANT

The single Post-Contact Coalescent variant sample in this study (Iron Shooter site, 39HU217) exhibits a diversified resource use pattern--a pattern similar to the Extended Coalescent variant, with some interesting differences. Again, a high percentage of locally available materials is present (77.7%), but almost no non-local subarea materials are in evidence (1.9%). A relatively high percentage (20.4%) of non-local, non-subarea materials is present, however. This pattern may be explainable in terms of the known cultural dynamics of the post-contact period.

A distinguishing characteristic of Post-Contact Coalescent variant occupations is evidence of Euro-American contact in the form of European trade goods such as metal implements (see, for example, Lehmer 1971, Lehmer and Jones 1968). The participation of the Middle Missouri villagers in this trade and the potential impact of trade upon village cultures has been discussed by various authors (e.g., Deetz 1965; Ewers 1968; Wood 1972, 1974; Toom 1979). The apparent pattern of Post-Contact lithic resource exploitation noted here may be, in part, a reflection of participation in Euro-American trade.

The availability of metal implements, in particular, as replacements for many chipped stone tools, may have had a profound effect upon overall patterns of lithic resource use. The relatively high percentage of locally available materials in the Iron Shooter sample (77.7%) may reflect a carry over from Extended Coalescent patterns, and may also reflect the use of easily accessible local lithic materials where metal tools and materials were not available in sufficient quantities to meet all needs.

The almost total absence of non-local subarea materials (1.9%) in the Iron Shooter sample is curious. Apparently, site occupants did not have access to these materials or considered them unimportant. The former may reflect increased territoriality among Post-Contact villages along the Missouri River Trench--an outgrowth of participation in Euro-American trade and the need to strictly control the movements of other village groups within the Middle Missouri subarea in order to maintain a competitive edge in the trade system. Thus, the occupants of Iron Shooter may not have been able to exploit non-local subarea materials because access to them may have been denied by other post-contact village groups. Likewise, the group at Iron Shooter may have attempted to prevent other post-contact village groups from entering the Lake Sharpe area.

When non-local non-subarea materials from Iron Shooter are considered, a relatively high level of usage of these materials is apparent (20.4%). As with local materials, the relatively high frequency of use may reflect a carry over from the Extended Coalescent pattern, and may also reflect the use of lithic materials when metal tools and materials were not available in sufficient quantities to meet all needs. The introduction of the horse during the post-contact period may also have influenced the utilization of non-local non-subarea materials. Horses would have greatly increased the mobility of post-contact villagers, facilitating the acquisition and transportation of distant lithic resources.

By projecting the lithic resource utilization data from Iron Shooter to a tentative pattern of lithic resource use for the

Post-Contact Coalescent variant as a whole, it can be seen that local materials and non-local non-subarea materials were frequently used, while non-local subarea materials were generally excluded from use. This pattern of resource exploitation suggests that post-contact villagers in the Lake Sharpe area restricted their resource exploitation to the immediate locale virtually ignoring the Missouri trench to the north and south. It is believed that this phenomenon reflects increased local territoriality among post-contact peoples--an attempt to control trade in the vicinity of each village by excluding other village groups from a given area. The utilization of non-local non-subarea materials, however, indicates that post-contact villagers extended their activities far beyond the local area, onto the Plains of southwestern South Dakota. This implies that Post-Contact Coalescent cultures did not assume a solely local focus within the Lake Sharpe area and that Post-Contact Coalescent cultures of the Middle Missouri subarea were not only locally oriented and endemic, but were also non-locally oriented and pandemic, much like their Initial and Extended Coalescent predecessors.

SUMMARY AND CONCLUSIONS

Chipped stone artifact samples from seven archeological sites located in the Lake Sharpe (Big Bend) area of the Middle Missouri subarea have been classified according to raw material type. Two sites contained components assignable to the Plains Archaic tradition, three sites contained components assignable to the Plains Woodland tradition and four sites contained components assignable to the Coalescent tradition of the Plains Village pattern. The Coalescent tradition components may be further broken down into the Initial Coalescent (one component), Extended Coalescent (two components) and Post-Contact Coalescent variants (one component). Tentative patterns of lithic resource utilization have been suggested based on sample data.

Lithic raw material types identified in each sample have been divided into three groups: 1) materials available locally in the Lake Sharpe area (local materials), 2) materials available within the confines of the Middle Missouri subarea but outside the Lake Sharpe area (non-local subarea materials), and 3) materials available only beyond the limits of the Middle Missouri subarea (non-local, non-subarea materials). By maintaining the distinctions between local and non-local resources, insights were gained into the territoriality, cultural contacts and trade systems of these archeological entities.

A preponderance of local material was found in the Plains Archaic tradition samples. Little indication of non-local material utilization was evident. This suggests that territoriality, cultural contacts and trade systems of Plains Archaic peoples in the Lake Sharpe area did not extend much beyond this segment of the Middle Missouri subarea. The hypothesis is offered that Plains Archaic populations in the Lake Sharpe area limited their resource exploitation activities to the immediate locale while they were in residence. This may imply a local focus for all Plains Archaic cultures in the Middle Missouri subarea. It may be further hypothesized that Plains Archaic cultures of the Middle Missouri subarea were locally oriented and endemic. The expected archeological consequence of an endemic Archaic population would be a number of local or areal variations (i.e., phases), loosely linked together by broad cultural similarities.

Similar conclusions were arrived at for the Plains Woodland tradition samples studied. Local materials dominate each sample, though a somewhat higher percentage of non-local subarea materials is noted. This suggests that the territoriality, cultural contacts and trade systems of Plains Woodland peoples in the Lake Sharpe area did not extend much beyond this part of the Middle Missouri subarea. The indication of expanded range within the Middle Missouri subarea, but not beyond, is present. The hypothesis is offered that Plains Woodland populations in the Lake Sharpe area limited resource exploitation to the immediate locale, for the most part, while in residence. This in turn implies a local focus for Plains Woodland cultures in the

Middle Missouri subarea. It may be further hypothesized that Plains Woodland cultures of the Middle Missouri subarea were also locally oriented and endemic. The expected archeological consequence of an endemic Woodland population would be a number of local or areal variations (i.e., phases) loosely linked by broad cultural similarities.

The Coalescent tradition Plains Village pattern chipped stone samples exhibited a wide range of variation in lithic resource use. This variation is believed to reflect, in part, differences between the three Coalescent tradition variants under study. A common pattern that did emerge from the village materials was a significant use of non-local materials, suggesting that territoriality, cultural contacts and trade systems for Coalescent peoples extended beyond the Lake Sharpe area and the Middle Missouri subarea. In other words Coalescent populations in the Lake Sharpe area did not limit their exploitive activities to the immediate locale, but extended them to include other areas of the Middle Missouri subarea and/or the Plains of southwest South Dakota. This implies that Coalescent cultures assumed a non-local, as well as a local, focus within the Lake Sharpe area. It may be further hypothesized that Coalescent cultures of the Middle Missouri subarea were not only locally oriented and endemic, but were also non-locally oriented and pandemic. The expected archeological consequence of a pandemic Plains Village Coalescent population would be a number of regional variations (i.e., phases), closely linked by cultural similarities.

These interpretations of prehistoric lithic resource use patterns in the Lake Sharpe area, and hypotheses generated from them, must be viewed as tentative. Only a small number of components from the various archeological units identified in the area were subjected to analysis. In order to strengthen these interpretations, many more components must be added to the study, and the hypotheses tested. Furthermore, lithic resource utilization is only a single aspect of the total spectrum of resource exploitation. Other patterns of resource use (e.g., fauna, flora) must also be explored in order to

arrive at a comprehensive picture of resource exploitation over time. This study does suggest, however, the utility of examining lithic resource utilization patterns in the attempt to gain insights into a group's total resource exploitation pattern.

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VOLUME III

APPENDIX 1

ANALYSIS OF CERAMIC MATERIALS FROM SITES 39HU97, 39HU214 AND 39HU217, LAKE SHARPE, SOUTH DAKOTA

SECTION J

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APPENDIX 1, SECTION J

ANALYSIS OF CERAMIC MATERIALS FROM SITES 39HU97, 39HU214 AND 39HU217, LAKE SHARPE, SOUTH DAKOTA

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INTRODUCTION

Three Plains Village Tradition sites (39HU97, 39HU214, 39HU217) investigated in conjunction with the 1978 Big Bend Survey Project yielded ceramic samples large enough to be used in an analysis of the temporal relationships between components assigned to the Extended Coalescent variant, and the Felicia and Talking Crow phases. The purpose of this analysis is to more fully evaluate the cultural-historical significance of these and other Coalescent tradition components within and outside the Big Bend Reservoir. The following discussion presents the results of two separate studies. Components used in the analyses are listed in Table J-1 with locations illustrated in Figure J-1. These components will be arranged in inferred chronological order based on the similarity of their ceramic assemblages. A classification of the pottery from these and other Big Bend sites surveyed in 1978 appears in Attachment 1.

EXTENDED COALESCENT AND FELICIA PHASE

The percentages of three descriptive rimsherd categories (i.e. types) among 32 Extended Coalescent and Felicia phase components are presented in Table J-2. Note that these categories differ from those employed in the description of the pottery from 39HU97, 39HU214 and 39HU217 (see Attachment 1, Table J-11). A factor analysis was used to reduce the percentages of the three types into a single dimension or pattern. This was done in the following fashion. The data matrix in Table 2 was input into <u>Biomedical Computer Programs</u> BMDP4M factor analysis program (Dixon 1975:357-391) with all default options in effect, which means that a R-mode principal components analysis with varimax rotation was performed. A R-mode analysis is one in which the initial step in the analysis is to determine the relationships between the three ceramic types. These relationships are measured by Pearson's correlation coefficients between all

Table J-1. Components employed in the analysis of ceramic variation within the Extended Coalescent variant, and the Felicia and Talking Crow phases.

Taxonomic assignment; component	Source of Data
Extended Coalescent:	
No Heart Creek (39AR2)	Hurt 1970
39AR7	Johnston and Hoffman 1966
39BR201	Weakly 1961
Demery (39C01)	Woolworth and Wood 1964
Potts (39C019)	Stephenson 1971
Fox Island (39DW230)	Kotch and Starr 1968
Molstad (39DW234)	Hoffman 1967
Scalp Creek (39GR1)	Hurt 1952
Little Pumpkin (39HU97)	This report, Section F
Standing Bull (39HU214)	This report, Section F
Fry A (39HU223)	Jensen, n.d.
Stricker B (39LM1)	Smith 1975
Clarkstown B (39LM47)	Smith 1963
Meander (39LM201)	Husted 1965a
Spain A (39LM301)	Smith and Grange 1958
Rosa B (39P03)	Hurt 1974
Hosterman (39P07)	Miller 1964
Gettysburg (39P0209)	Coleman 1968
C. B. Smith (39SL29)	McNutt 1958
Over's La Roche (39ST9)	Hoffman 1968
Meyer (39ST10)	Hoard 1949
H. P. Thomas 2 (39ST12)	Falk, Johnson and Richtsmeier n.d.
Leavitt (39ST215)	Lehmer and Jones 1968
Bower's La Roche (39ST232)	Hoffman 1968
Swan Creek A (39WW7)	Hurt 1957
Spiry (39WW10)	Baerreis and Dallman 1961
Payne (39WW302)	Wilmeth 1958
Felicia phase:	
Two Teeth B (39BF204)	Smith and Johnson 1968
Cadotte (39HE202)	Smith and Johnson 1968
Black Partizan A (39LM218)	Caldwell 1966
39LM219 A	Husted 1965b
Crazy Bull (39LM220)	Frantz 1962
Talking Crow phase:	
Medicine Crow 1-5 (39BF2)	Ahler, Falk and Johnson n.d.
Talking Crow III (39BF3)	Smith 1977
39BF4	Kivett and Jensen 1976
Farm School A (39BF220)	Neuman 1961
Fire Cloud (39BF237)	Karklins 1970
Sanitarium (39BR6)	Kruschwitz n.d.
Hitchell (39CH45)	Johnston 1967
Iron Shooter (39HU217)	Peterson n.d.
Peterson (39LM215)	Jensen, 1966
Breeden B (39ST16)	Brown 1974

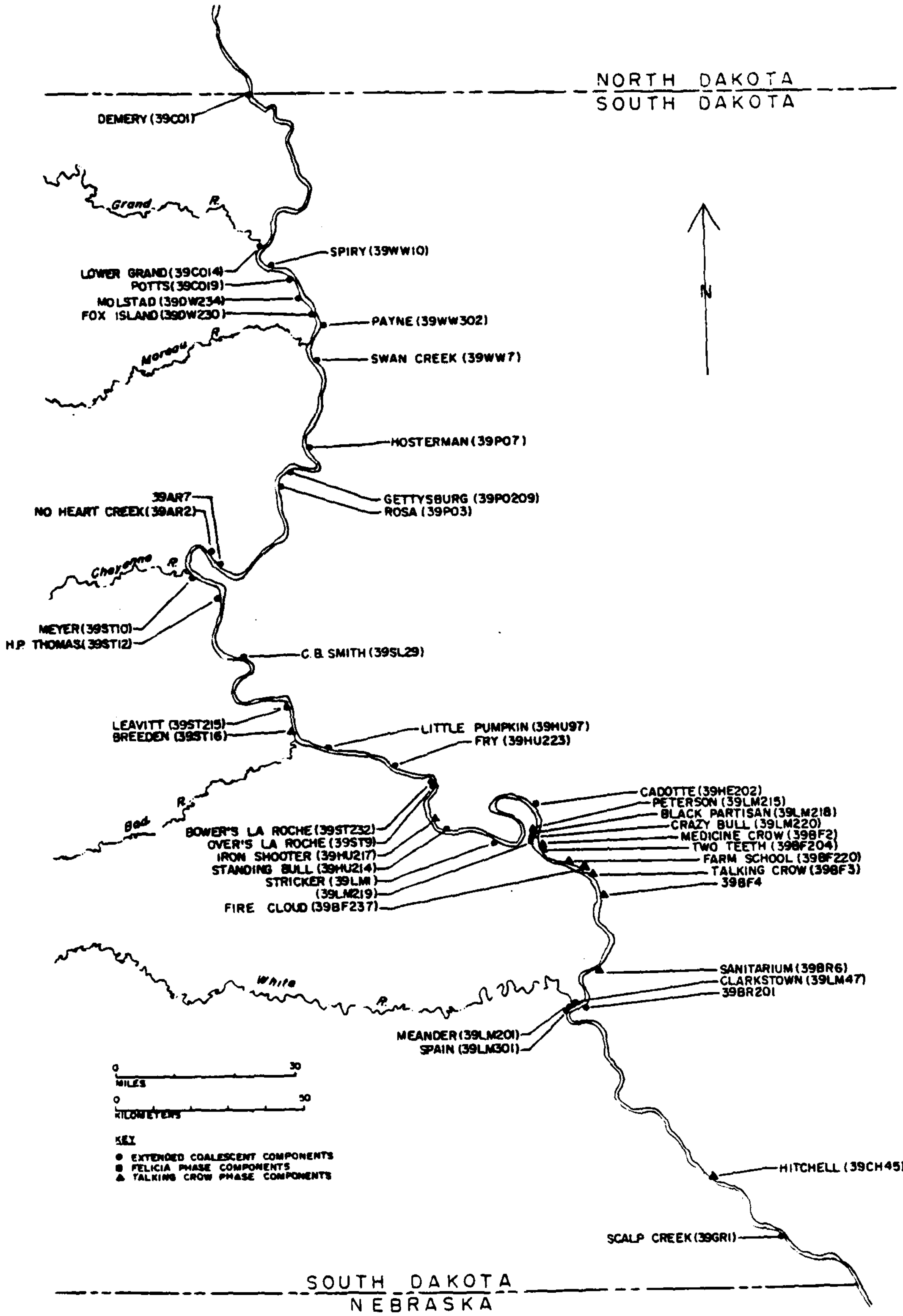

Figure J-1. Location of Coalescent Tradition components used in the analysis.

Table J-2. Data matrix of three descriptive rimsherd categories for 32 Extended Coalescent and Felicia phase components.

Variant and Component	1. S-rims with trailed exterior rims %	N	2. Straight/curved rims with tool impressed lips %	N	3. Straight/curved rims with trailed exterior rims %	N	Sample Size
Extended Coalescent							
No Heart Creek (39AR2)	14.07	103	17.21	126	68.17	499	732
39AR7	0.00	0	19.05	20	75.24	79	105
39BR201	26.88	50	61.29	114	0.00	0	186
Demery (39CO1)	3.08	35	49.52	563	43.09	490	1137
Potts (39CO19)	17.11	292	5.74	98	68.37	1167	1707
Fox Island (39DW230)	27.87	34	17.21	21	50.00	61	122
Molstad (39DW234)	15.82	137	9.24	80	67.90	588	866
Scalp Creek (39GR1)	10.56	15	69.01	98	20.42	29	142
Little Pumpkin	12.82	15	41.02	48	41.88	49	117
Standing Bull (39HU214)	7.84	12	27.45	42	58.82	90	153
Fry A (39HU223)	25.00	15	36.67	22	28.33	17	60
Stricker B (39LM1)	15.68	37	68.22	161	13.13	31	236
Clarkstown B (39LM47)	6.59	6	59.34	54	32.97	30	91
Meander (39LM201)	39.81	43	41.67	45	13.89	15	108
Spain A (39LM301)	11.70	145	50.44	625	36.08	447	1239
Rosa B (39PO3)	38.57	54	37.86	53	11.43	16	140
Hosterman (39PO7)	31.89	839	32.84	864	19.31	508	2631
Gettysburg (39PO209)	4.40	38	53.53	462	35.69	308	863
C. B. Smith (39SL29)	2.94	6	7.84	16	82.35	168	204
Over's La Roche (39ST9)	5.79	43	24.50	182	67.56	502	743
Meyer (39ST10)	0.00	0	19.35	12	80.65	50	62
H. P. Thomas 2 (39ST12)	2.70	2	37.84	28	59.46	44	74
Leavitt (39ST215)	3.83	7	14.21	26	81.43	149	183
Bower's La Roche (39ST232)	16.55	49	14.19	42	67.23	199	296
Swan Creek A (39WW7)	25.16	78	40.96	127	23.23	72	310
Spiry (39WW10)	42.70	266	15.57	97	21.83	136	623
Payne (39WW302)	32.32	64	24.75	49	31.31	62	198
Felicia phase							
Two Teeth B (39BF204)	22.64	362	69.98	1119	0.94	15	1599
Cadotte (39HE202)	31.13	47	56.95	86	1.32	2	151
Black Partizan A (39LM218)	14.29	47	68.69	226	5.17	17	329
39LM219 A	28.21	22	57.69	45	1.28	1	78
Crazy Bull (39LM220)	21.11	38	51.67	93	4.44	8	180

Note: Percentages are based on sample size. Since minor types are not included in the data matrix, total percentages for the three types do not equal 100%.

unique combinations of types, taken two-at-a-time (Table 3). These coefficients range in value from -1.00 (perfect negative relationship) to +1.00 (perfect positive relationship). A positive relationship means that as the percentage of one type increases in value throughout the components, another type will also increase in value. Conversely, a negative relationship means that as one pottery type increases in relative frequency (percent) another type will decrease. As correlation coefficients become more extreme in value (high positive or high negative), the more applicable this generalization becomes. Referring to the correlation matrix in Table 3, components with high percentages of straight/curved rims with trailed exterior rims (type 3) generally have low percentages of s-rims with trailed exterior rims (type 1) and straight/curved rims with tool impressed lips (type 2) because the correlation coefficient between type 3 and types 1 and 2 are high with negative signs (-0.65 and -0.80). Since the correlation coefficient between types 1 and 2 is near 0.00, it is impossible to predict with any degree of confidence the percentage of one type within a component given the value of the other.

Principal components analysis next takes the information in the correlation matrix (Table J-3) and reduces it to a smaller number of dimensions which appear in an unrotated factor matrix. The unrotated factor matrix is usually presented although it is normally not the focus of interpretation. A rotated factor matrix will generally render patterns in the data more interpretable (see Rummel 1967· 1970 or Gorsuch 1974 for extended discussions of this and other topics on factor analysis). Since only one factor was extracted, the unrotated and rotated factor matrices are identical--the latter is presented in Table J-4. The rotated factor matrix has reduced the information present in the correlation matrix (Table J-3) into a single dimension or pattern labeled factor. Since varimax orthogonal rotation was used, the factor loadings of the three ceramic types appearing under factor 1 can be interpreted as correlation coefficients. Table 4 is related to Table 3 in a systematic fashion. Since types 1 and 2 both have high negative correlations with type 3 (see Table J-3) and are uncorrelated with each other, they have high factor loadings of the same sign on factor 1. Although the factor loadings of

Table J-3. Matrix of Pearson correlation coefficients for three descriptive rimsherd categories based on 32 Extended Coalescent and Felicia phase components.

Descriptive Rimsherd Categories	Descriptive Rimsherd Categories 1	2	3
1. S-rims with trailed exterior rims	1.00		
2. Straight/curved rims with tool impressed lips	0.09	1.00	
3. Straight/curved rims with trailed exterior rims	-0.65	-0.80	1.00

Table J-4. Sorted rotated factor matrix of three descriptive rimsherd categories based on 32 Extended Coalescent and Felicia phase components, principal components analysis, varimax rotation.

Descriptive Rimsherd Categories	Factor 1	h^2
3. Straight/curved rims with trailed exterior rims	<u>1.00</u>[a]	1.00
2. Straight/curved rims with tool impressed lips	<u>-0.79</u>	0.62
1. S-rims with trailed exterior rims	<u>-0.67</u>	0.45
Eigenvalues	2.07	
Percent total variance	69.00	
Percent common variance	100.00	

[a]Note: High loadings are underlined.

types 1 and 2 have negative signs, this does not necessarily have to be the case. All that is required is that they be of like sign and opposite in sign to the type 3 factor loading. The higher the factor loading of a type on factor 1, the more important the type is to the composition of the factor. This will be illustrated later. Communalities (designated by h^2) are the sum of the squares of the loadings on all factors for each type. Eigenvalues are obtained by summing the squares of the loading for any particular factor ($1.00^2 + 0.79^2 + -0.67^2$). Percent total variance is calculated by dividing the eigenvalues by the number of variables and multiplying by 100 ($2.07/3 \times 100$). Percent total variance measures the amount of variance present in the correlation matrix accounted for by a factor.

Up to this point, the discussion has focused on the relationships between types. The purpose of this analysis is to determine the relationships between the components. A R-mode principal components analysis does this by assigning factor scores to the components. These factor scores are presented in Table J-5. Factor scores are calculated by multiplying the standard scores of each component on the percentages of the three types by the standardized weight or loading (i.e. factor score coefficients) of each type on factor 1. Factor scores can be related to the percentages of the types within each component (Table 2) in the following manner. If a component has a high positive factor score, it will generally have a high percentage of straight/curved rims with trailed exterior rims because this type has a high positive factor loading on factor 1 (See Table J-4). As the factor scores decrease, components will contain lower percentages of this type. Because the other two types have high negative factor loadings on factor 1, the situation is just the reverse. That is, components with high factor scores will generally have low percentages of these types. Put another way, components with low (high negative) factor scores will have high percentages of straight/curved rims with tool impressed lips and s-rims with trailed exterior rims. Because the factor loadings of these two types are not as high as type 3, regardless of sign, the

Table J-5. Factor scores of 32 Extended Coalescent and Felicia phase components based on a principal components analysis of three descriptive rimsherd categories, varimax rotation.

Variant and Component	Factor 1
Extended Coalescent	
No Heart Creek (39AR2)	1.00
39AR7	1.46
39BR201	-1.35
Demery (39CO1)	0.24
Potts (39CO19)	1.14
Fox Island (39DW230)	0.32
Molstad (39DW234)	1.10
Scalp Creek (39GR1)	-0.72
Little Pumpkin (39HU97)	0.13
Standing Bull (39HU214)	0.81
Fry A (39HU223)	-0.35
Stricker B (39LM1)	-0.96
Clarkstown B (39LM47)	-0.21
Meander (39LM201)	-1.08
Spain A (39LM301)	-0.12
Rosa B (39PO3)	-1.02
Hosterman (39PO7)	-0.61
Gettysburg (39PO209)	0.00
C. B. Smith (39SL29)	1.71
Over's La Roche (39ST9)	1.07
Meyer (39ST10)	1.54
H. P. Thomas 2 (39ST12)	0.76
Leavitt (39ST215)	1.55
Bower's La Roche (39ST232)	0.97
Swan Creek A (39WW7)	-0.52
Spiry (39WW10)	-0.53
Payne (39WW302)	-0.26
Felicia phase	
Two Teeth B (39BF204)	-1.39
Cadotte (39HE202)	-1.36
Black Partizan A (39LM218)	-1.07
39LM219 A	-1.30
Crazy Bull (39LM220)	-0.94
39LM219 A	-1.30
Crazy Bull (39LM220)	-0.94

relationships between the value of the factor scores and the original percentage data are not as predictable as in the case of straight/curved rims with trailed exterior rims (type 3).

The factor scores of the components describe a relationship between the similarity of the 32 ceramic assemblages. In order to interpret the pattern which factor 1 represents, the factor scores of the components were plotted (see Figure J-2). The plot arranges the components from lowest (bottom) to highest (top) factor scores. From this plot, it is apparent that the Post-Contact Coalescent Felicia phase components cluster at or below the -1.00 factor score value. These components are dated at between A.D. 1675-1700 (Lehmer 1971:201). The prehistoric Extended Coalescent components are, for the most part, arranged nearer the upper end of the figure. Lehmer (1971:33) has dated the Extended Coalescent variant at A.D. 1550-1675. Information will be presented later that will indicate that Lehmer's beginning date for the Extended Coalescent may be too late. On the basis of this information and the fact that there is no overall relationship between the geographic location of the components and their factor scores, factor 1 is interpreted to be temporal in nature. If this is the case, and given that the independent evidence for dating presented above is accepted, the components increase in age with increasing (more positive or less negative) factor scores. This would mean that as time progresses, Extended Coalescent pottery gradually increases in the percentage of s-rims with trailed exterior rims and straight/curved rims with tool impressed lips at the expense of straight/curved rims with trailed exterior rims. Felicia phase components can be seen as continuing this trend and, as will be argued later, they form a transition between the Extended Coalescent variant and the Talking Crow phase.

Before proceeding with a discussion of temporal variability within the Extended Coalescent variant and Felicia phase, it should be made clear that several assumptions must be made in order to interpret the arrangement of components on factor 1 as a temporal sequence. Further, these assumptions may or may not be true. Due to the broad spatial distribution (see Figure J-1) the defined components represent the remains of an unknown number of discrete

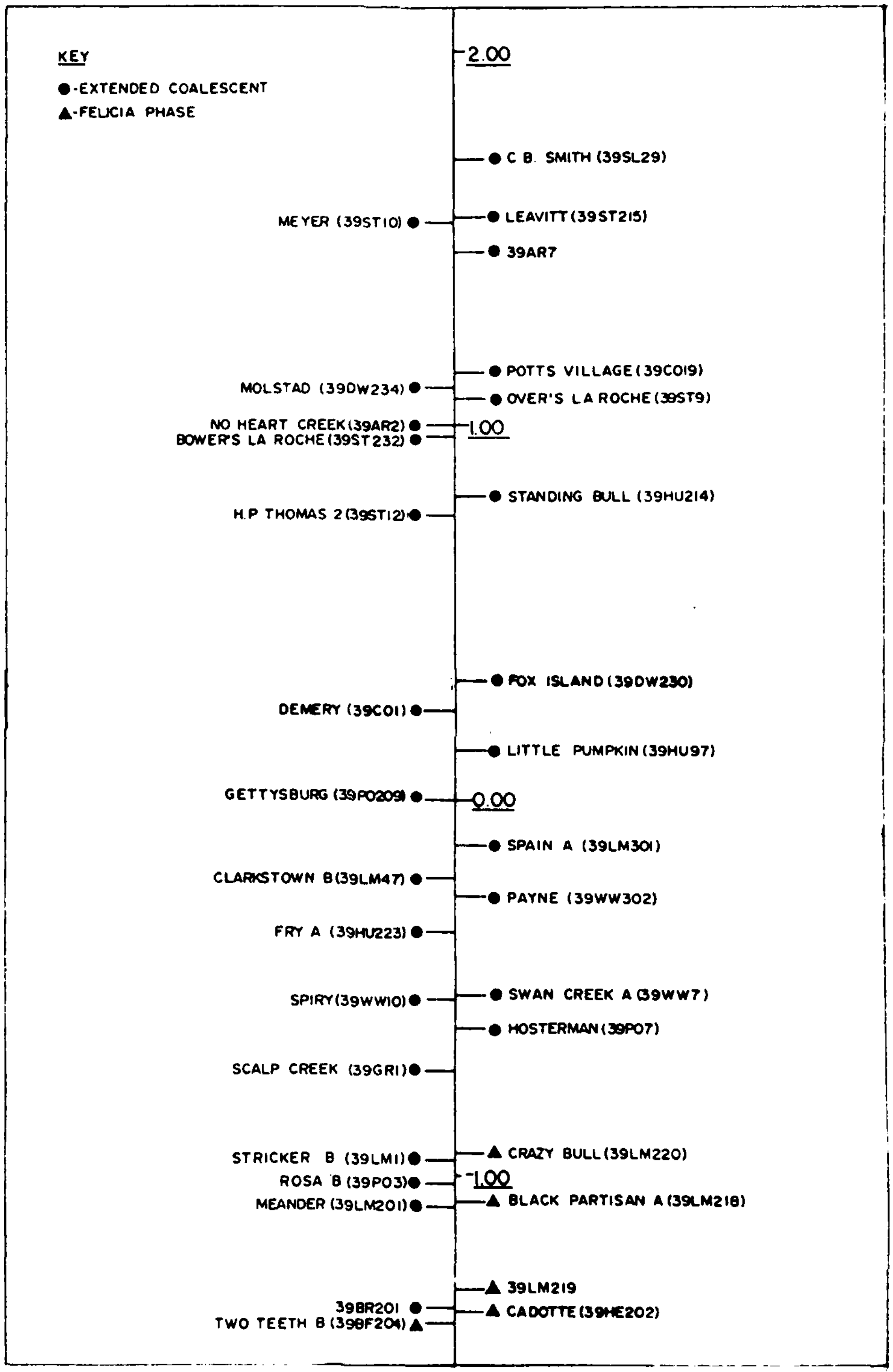

Figure J-2. Plot of factor scores of 32 Extended Coalescent and Felicia phase components on factor 1, principal components analysis, varimax rotation.

village groups. Some of the components may represent a single village group at different points in time. Under these circumstances, the rates at which ceramic change occur within a village or the direction or trajectory of this change are unknown and consequently cannot be controlled. Therefore, it is assumed for the purposes of this analysis that there were no significantly different rates or trajectories of ceramic change between contemporaneous villages or through time. In addition, if the ordering of components is to be interpreted in a strictly chronological fashion, it must also be assumed that either there was no significant diffusion of pottery types or if diffusion occurred, it occurred relatively rapidly. Deetz and Dethlefson (1965) have explored the ways in which diffusion over space can lead to misleading chronologies if the chronologies are based on the diffusing style. It can also be noted that the sample sizes of the ceramic assemblages differ in size with some of them being very small. Small sample sizes may be less representative of the entire assemblage from a component than larger samples. Since systematic sampling designs were not used in excavating these sites, it is impossible to evaluate the nature of the ceramic samples in terms of adequacy and representativeness (see Lastrucci 1963:120-124 for a discussion of sampling). With these problems in mind, the following interpretation of the temporal ordering of the components is presented.

Referring to Figure J-2, it is apparent that the earliest group of Extended Coalescent occupations is composed of four components (C.B. Smith, Leavitt, Meyer and 39AR7). All components are located in the Bad-Cheyenne Region (Figure J-1). This may indicate that this area was the first to be occupied by Extended Coalescent groups. The high density of Extended Coalescent components in the area (see Lehmer 1971: Figure 77), particularly near the confluence of the Cheyenne and Missouri Rivers ("Little Bend" area) would support this idea. The next temporal group of eight components is composed of two from the "Little Bend" area (No Heart Creek, H. P. Thomas 2), two upriver in the Grand-Moreau Region (Potts and Molstad) and three downriver in the Big Bend Region (Over's La Roche, Bower's La Roche and Standing Bull). This may indicate that as Extended Coalescent

peoples continued to occupy the Bad-Cheyenne Region, others moved out of the area. There are several problems with this interpretation. First, the Extended Coalescent components used in this analysis represent about 15 percent of all Extended Coalescent components listed by Lehmer (1971: Figure 77). Second, there is not an adequate radiocarbon chronology for the Extended Coalescent variant. The few radiocarbon dates which are available (see Ahler, Falk and Johnson n.d.) are not in agreement with the ordering of units in Figure J-2. Third, the Extended Coalescent Lower Grand (Davis) site (39CO14) has a well established average calibrated radiocarbon date (Ahler, Falk and Johnson n.d.); also see Ahler 1975:80). If the earliest Extended Coalescent components in the Grand-Moreau Region (including lower Grand) post-date the early occupations in the Bad-Cheyenne Region, then the components in the latter region may be earlier than A.D. 1350. On the other hand, the early occupations in the Grand-Moreau Region may have been contemporaneous or even earlier than those in the Bad-Cheyenne Region. Certainly, there is a high density of Extended Coalescent settlements in the Grand-Moreau Region (Lehmer 1971: Figure 77) suggestive of a long occupational sequence.

Within the Big Bend Region then, the earliest Extended Coalescent occupations would appear to have been concentrated within the upper portion of the region. Over's La Roche and Bower's La Roche have nearly identical ceramic assemblages. Radiocarbon dates range from A.D. 1253 ± 88 for Bower's La Roche to A.D. 1470-1610 for Over's La Roche (Ahler, Falk and Johnson n.d.) and thus conflict with the ceramic seriation. Although the date for Bower's La Roche may appear to be much too early for an Extended Coalescent occupation, the date from Lower Grand suggests that the Extended Coalescent variant may have been a viable entity long before the date of A.D. 1550 which Lehmer (1971:33) accepts for the beginning of the variant. If this is the case, a complex pattern of interactions between Extended Coalescent, Initial Coalescent and Middle Missouri tradition groups could be envisioned. Supporting this idea are the series of radiocarbon dates from the Initial Coalescent component at Whistling Elk

(39HU242) ranging from ca. A.D. 850-1400 (see Section A, this report). If additional work at Standing Bull and other components in the Big Bend Region thought to be early in the Extended Coalescent sequence confirms the relative temporal positions suggested in this analysis, a firm radiocarbon chronology of these components will be crucial in any understanding of the development of this taxon and its relationship to the Initial Coalescent variant and the Middle Missouri tradition.

H. P. Thomas 2 and Fox Island are separated by a temporal hiatus which is difficult to interpret because components which could fall between these two occupations may not have been excavated. Most of the middle to late Extended Coalescent components falling between Fox Island and Scalp Creek are located in the Grand-Moreau and Big Bend Regions. Demery is located to the north in the Cannonball Region whereas Scalp Creek is far south in the Fort Randall Reservoir. There are no components from this group in the Bad-Cheyenne Region. The occupations in the Big Bend and Grand-Moreau Regions represent a continuation from earlier Extended Coalescent settlements in the areas. Spain A, Clarkstown B and Scalp Creek appear to represent a late southern extension of Extended Coalescent settlements. Villages such as Little Pumpkin may be occupations transitional between the early Extended Coalescent components in the Big Bend Region and Spain A, Clarkstown B and Scalp Creek. No radiocarbon dates are available from these latter three components, making the middle to late Extended Coalescent villages in the Big Bend Reservoir, such as Little Pumpkin, important to our understanding of the Coalescent tradition.

The latest nine components in the temporal sequence include all the Felicia phase occupations and four Extended Coalescent villages. With the exception of Rosa B, all components are located in the lower Big Bend Region (Figure J-1). There are no radiocarbon or dendrochronological dates from any of these components. It will be suggested in the following analysis that the Post-Contact Coalescent Talking Crow phase represents a direct cultural development from these late Extended Coalescent and Felicia phase occupations in the Big Bend Region. There is no clear cultural continuity between any late Extended

Coalescent components and the Post-Contact Coalescent Bad River and Le Beau phases, however. Late Extended Coalescent components such as Rosa B or the postulated late Extended Coalescent occupation at Lower Grand site (Lehmer 1971:116, 127), may represent such a link.

TALKING CROW PHASE

The second principal components analysis focuses on the similarity of ceramic assemblages from 14 Post-Contact Coalescent Talking Crow phase components. These components are listed in Table J-1 and their locations are illustrated in Figure J-1. As in the previous analysis of Extended Coalescent and Felicia phase components, this analysis is based on a data matrix listing the percentages of descriptive rimsherd categories by component (Table J-6). The four types listed in this table differ from those used in the previous analysis. The data matrix was input into Biomedical Computer Programs BMDP4M factor analysis program (Dixon 1975:357-391). A R-mode principal components analysis with orthogonal rotation was performed. Since an extended discussion of the steps involved in a principal components analysis is included in the previous analysis, most comments are not repeated here.

The matrix of Pearson's correlation coefficients describing the relationships between the four pottery types is presented in Table J-7. This matrix indicates that straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips (type 1) are negatively correlated with straight/curved rims with brushed exterior rims and tool impressed lips (type 2) and straight/curved rims with cord impressed lips (type 4). This means that if a component contains a high percentage of type 1, it will generally have low percentages of types 2 and 4, and vice versa. There is a high positive correlation between straight/curved rims with brushed exterior rims and tool impressed lips (type 2) and straight/curved rims with cord impressed lips (type 4) which indicates that components with high relative frequencies of one type have high percentages of the other.

The next step in the analysis was to calculate the unrotated factor matrix, which appears in Table J-8. The two factors in this

Table J-6. Data matrix of four descriptive rimsherd categories for 14 Talking Crow phase components.

Component	1[a]		2		3		4		Sample Size
	%	N	%	N	%	N	%	N	
Medicine Crow 1 (39BF2)	65.98	64	24.74	24	0.00	0	2.06	0	97
Medicine Crow 2 (39BF2)	61.39	221	26.11	94	3.61	13	2.22	8	360
Medicine Crow 3 (39BF2)	37.77	159	36.34	153	4.04	17	11.16	47	421
Medicine Crow 4 (39BF2)	35.33	118	44.01	147	3.59	12	10.78	36	334
Medicine Crow 5 (39BF2)	36.23	25	39.13	27	2.90	2	13.04	9	69
Talking Crow III (39BF3)	59.28	1111	14.09	264	7.74	145	3.90	73	1874
39BF4	79.49	93	5.13	6	9.40	11	0.00	0	117
Farm School A (39BF220)	91.86	79	0.00	0	6.98	6	0.00	0	86
Fire Cloud (39BF237)	93.22	55	0.00	0	0.00	0	0.00	0	59
Sanitarium (39BR6)	98.72	77	0.00	0	1.28	1	0.00	0	78
Hitchell (39CH45)	87.34	69	0.00	0	0.00	0	1.27	1	79
Iron Shooter (39HU217)	63.69	114	9.50	17	11.73	21	6.14	11	179
Peterson (39LM215)	41.18	35	38.82	33	0.00	0	7.06	6	85
Breeden B (39ST16)	52.40	109	24.52	51	0.00	0	12.50	26	208

Note: Percentages based on sample size. Since minor types are not included in the data matrix, percentages of the four types do not add up to 100%.

[a]Descriptive Rimsherd Category:
1 = Straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips.
2 = Straight/curved rims with brushed exterior rims and tool impressed lips.
3 = Straight/curved rims with smooth/simple stamped exterior rims and undecorated lips and rims.
4 = Straight/curved rims with cord impressed lips.

Table J-7. Matrix of Pearson's correlation coefficients of four descriptive rimsherd categories based on 14 Talking Crow phase components.

	Descriptive Rimsherd Categories			
Descriptive Rimsherd Categories	1	2	3	4
1. Straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips	1.00			
2. Straight/curved rims with brushed exterior rims and tool impressed lips	-0.95	1.00		
3. Straight/curved rims with smooth/simple stamped exterior rims and undecorated lips and rims	0.15	-0.21	1.00	
4. Straight/curved rims with cord impressed lips	-0.88	0.81	-0.10	1.00

Table J-8. Unrotated factor matrix of four descriptive rimsherd categories based on 14 Talking Crow phase components, principal components analysis, varimax rotation.

Descriptive Rimsherd Category	Factor 1	Factor 2	h^2
1. Straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips	<u>-0.98</u>[a]	-0.16	0.99
2. Straight/curved rims with brushed exterior rims and tool impressed lips	<u>0.96</u>	-0.05	0.92
3. Straight/curved rims with smooth/simple stamped exterior rims and undecorated lips and rims	-0.17	<u>0.98</u>	0.99
4. Straight/curved rims with cord impressed lips	<u>0.93</u>	0.07	0.87
Eigenvalues	2.78	0.99	
Percent total variance	69.50	24.75	
Percent common variance	73.74	26.26	

[a]Note: High loadings are underlined.

table were then rotated to a varimax orthogonal solution. Table J-9 is the rotated factor matrix. Among other things, factor rotation results in factor loadings with values maximized on one factor and minimized on the other factors. For example, type 3 in Table J-8 has a -0.17 loading on factor 1 and a 0.98 loading on factor 2. In the rotated factor matrix (Table J-9) the loadings become -0.05 and 0.99 on factors 1 and 2, respectively. Types 1 and 4 show a similar change in factor loadings whereas the factor loadings of type 2 are not improved. In all cases, the changes in factor loadings from the unrotated to the rotated solutions are minor. Table J-9 indicates that factor 1 accounts for approximately two-thirds of the total variance in the correlation matrix as compared to factor 2 which accounts for 25 percent of the total variance. The high negative loading of type 1 on factor 1 and the corresponding high positive loadings of types 2 and 4 on the same factor means that factor scores of the 14 components (see Table J-10) on factor 1 are related in a systematic fashion. As factor scores among the 14 components increase in value (i.e., become more positive or less negative), the percentages of types 2 and 4 increase with a corresponding decrease in the percentage of type 1. Because the factor loading of type 3 on factor 2 is high and positive in sign, percentages of this type increase in value as factor scores increase. Since the two factors are orthogonal or uncorrelated with each other, there is no positive or negative relationship between the value of the factor scores of the components on the two factors.

In order to interpret the two factors, a plot of factor scores was made (see Figure J-3). Factor 1 can be interpreted to be temporal in nature if components with low factor scores are considered to be early in time and those with higher factor scores are later in the sequence. This interpretation is based almost entirely on the temporal sequence of the Plains Village period occupations at the Medicine Crow site. Forty-nine discrete provenience units from Medicine Crow were arranged in a continuous temporal sequence. Site stratigraphy provided independent confirmation of the sequence. The provenience units were grouped into five units numbered 1 (earliest)

Table J-9. Sorted rotated factor matrix of four descriptive rimsherd categories based on 14 Talking Crow phase components, principal components analysis, varimax rotation.

Descriptive Rimsherd Category	Factor 1	Factor 2	h^2
1. Straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips	<u>-0.99</u>[a]	-0.04	0.98
2. Straight/curved rims with brushed exterior rims and tool impressed lips	<u>0.95</u>	-0.17	0.93
3. Straight/curved rims with smooth/simple stamped exterior rims and undecorated lips and rims	-0.05	<u>0.99</u>	0.98
4. Straight/curved rims with cord impressed lips	<u>0.93</u>	-0.04	0.87
Eigenvalues	2.75	1.01	
Percent total variance	68.75	25.25	
Percent common variance	73.14	26.86	

[a]Note: High loadings are underlined.

Table J-10. Factor scores of 14 Talking Crow phase components based on a principal components analysis of four descriptive rimsherd categories, varimax rotation.

Component	Factor 1	Factor 2
Medicine Crow 1 (39BF2)	-0.15	-0.98
Medicine Crow 2 (39BF2)	0.01	-0.06
Medicine Crow 3 (39BF2)	1.22	0.17
Medicine Crow 4 (39BF2)	1.38	0.02
Medicine Crow 5 (39BF2)	1.41	-0.11
Talking Crow III (39BF3)	-0.02	1.07
39BF4	-0.78	1.41
Farm School A (39BF220)	-1.12	0.77
Fire Cloud (39BF237)	-1.24	-0.99
Sanitarium (39BR6)	-1.31	-0.70
Hitchell (39CH45)	-1.06	-0.95
Iron Shooter (39HU217)	0.02	2.09
Peterson (39LM215)	0.88	-0.90
Breeden B (39ST16)	0.77	-0.84

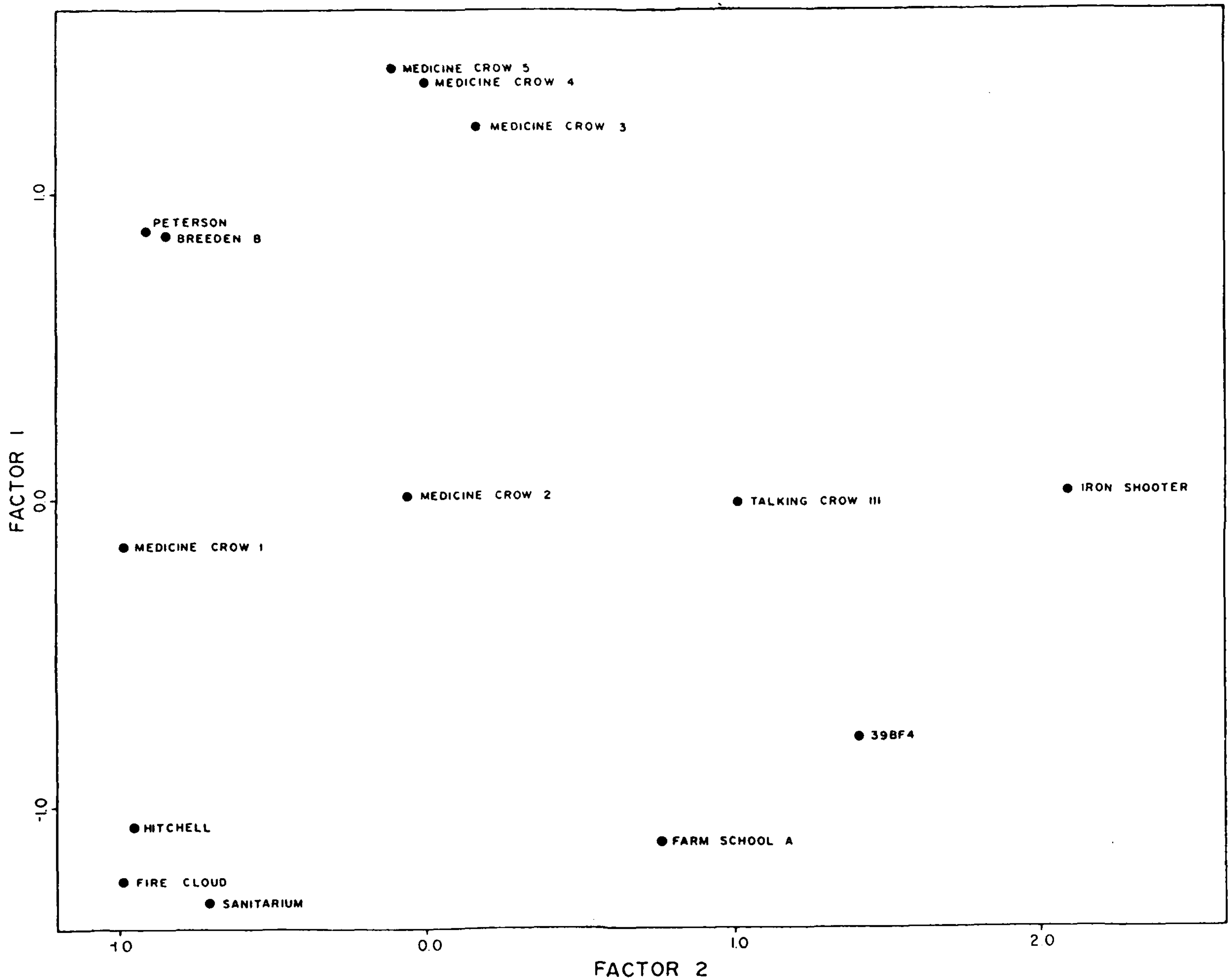

Figure J-3. Plot of factor scores of 14 talking Crow phase components.

through 5 (latest). The factor scores of these five units on factor 1 increase with time. Referring back to Table J-9, this means that straight/curved rims with brushed exterior rims and tool impressed lips (type 2) and straight/curved rims with cord impressed lips (type 4) increase in relative frequency through time with a corresponding decrease in straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips (type 1). Smith (1963:494) feels that rim brushing and cord impressed decorations are temporally sensitive attributes. Straight/curved rims with smooth/simple stamped exterior rims and tool impressed lips (type 1) are approximately equivalent to straight/curved rims with tool impressed lips (type 2) used in the previous analysis (see Table J-2). This type ranges from ca. 50-70 percent in Felicia phase components to a relative frequency in the early Talking Crow phase components varying from ca. 80-90 percent. This type increased in time throughout the Extended Coalescent and Felicia phase and early Talking Crow phase. The type then decreased in relative frequency later in the Talking Crow phase down to ca. 35 percent. This trend appears to relate late Extended Coalescent/Felicia phase cultural developments directly to Talking Crow phase occupations. This argument is strengthened due to the geographic proximity of these components.

Factor 2 cannot be interpreted at this time. The factor is defined exclusively by straight/curved rims with smooth/simple stamped exterior rims and undecorated lips and rims (type 3). The factor scores of the components cannot be systematically related to either temporal position or spatial location. Iron Shooter has the highest factor scores of any component on this factor indicating that it has a high relative frequency of type 3 compared to the other components (see Table J-6).

Focusing on the factor scores of the components on factor 1, the earliest group is composed of Fire Cloud, Farm School A, 39BF4, Sanitarium and Hitchell. The former three components are located in the Fort Thompson area, Sanitarium is near Chamberlain, with Hitchell the most southerly of all components included in this analysis.

Medicine Crow 1 and 2, Talking Crow III and Iron Shooter date to the middle of the Talking Crow phase sequence. Except for Iron Shooter which is located upriver from the major concentration of Talking Crow phase villages (see Lehmer 1971: Figure 82), these components are located in the Fort Thompson area. The Post-Contact occupations at the Peterson and Breeden sites date somewhat later. Peterson continues the Talking Crow sequence in the Fort Thompson area while Breeden B is located several miles upriver from Pierre, South Dakota. The latest three units are from Medicine Crow. It is impossible at this time to suggest that these late occupations at Medicine Crow represent the terminus of the Talking Crow phase because other Talking Crow phase villages, such as Oldham (39CH7) and Oacoma (39LM26), could not be included in the analysis.

Two of the components included in this analysis have been dated by dendrochronology (see Weakly 1971:24-25). The dates from Medicine Crow have been associated with Medicine Crow 3 (Ahler, Falk and Johnson n.d.) and have a range of outside dates of A.D. 1705-1776. None of these are cutting dates. The outermost ring of a single specimen from Talking Crow III is dated at A.D. 1707. If the latest dates from Medicine Crow are accepted as dating the occupation of Medicine Crow 3, then the temporal relationships between this unit and Talking Crow III are in agreement with the relative chronology established by the present ceramic analysis. This would mean that Iron Shooter was contemporaneous with Talking Crow III at about A.D. 1700. It may also indicate that Medicine Crow was one of the latest major Talking Crow phase villages to have been occupied, perhaps after Lehmer's (1971:202) terminal date of A.D. 1750 for the phase.

CONCLUSIONS

This analysis has attempted to relate three components investigated during the 1978 Big Bend Survey Project, 39HU97, 39HU214 and 39HU217, to other Coalescent tradition occupations within and outside the Big Bend area. Standing Bull (39HU214) is the earliest of the three

components and appears to represent one of the first Extended Coalescent occupations in the Big Bend Region. Little Pumpkin (39HU97) is somewhat later in the Extended Coalescent sequence. It may be one of a number of components in the Big Bend Region transitional between early and late Extended Coalescent occupations in the area. A program to develop a radiocarbon chronology of Extended Coalescent occupations in the Big Bend reservoir, the only area with significant numbers of Extended Coalescent components which have not been inundated, is proposed. Given the large number and wide distribution of components assigned to the Extended Coalescent variant, this variant is one of the more poorly dated of all Plains Village tradition cultural developments in the Middle Missouri Subarea. Iron Shooter (39HU217) is one of a number of Talking Crow phase components which represent a direct cultural development out of earlier Extended Coalescent and Felicia phase occupations. Iron Shooter dates to the middle of the Talking Crow sequence. Its location upriver from most of the Talking Crow villages is important for understanding the spatial and temporal relationships between Post-Contact Coalescent components in the Big Bend Region.

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ATTACHMENT 1

CLASSIFICATION OF POTTERY FROM THE 1978 LAKE SHARPE SURVEY

The purpose of this discussion is to provide background information on the classification of ceramic materials recovered during the 1978 survey of the left bank of the Big Bend reservoir. Included are listings of pottery types and bodysherds by site for all recovered materials (Tables J-11 and J-12). The following comments are based on these data. Primary references for the description of the pottery wares and their component types include:

- Talking Crow Ware (Smith 1951; Smith 1977)
- Stanley Ware (Lehmer 1951)
- Le Beau Ware (Hurt 1957)
- Iona Ware and Grey Cloud Horizontally Incised (Smith and Grange 1958; Smith and Johnson 1968)
- Campbell Creek Ware (Smith 1951; 1977)
- Arzberger Group (Spaulding 1956)

Much of the information on these wares and types in addition to other Plains Village tradition pottery from the Middle Missouri Subarea has been organized by Johnson (1980).

The specificity of the cultural-historical assessments depend on the nature of the ceramic samples. The major limiting factor is sample size: the larger a sample from a particular component (especially rimsherds), the more precise the taxonomic assignment. Post-Contact Coalescent components assigned to the Talking Crow phase have Talking Crow, Stanley and/or Le Beau types. Absence of the types assigned to Iona, Campbell Creek and Arzberger wares, and Grey Cloud Horizontally Incised precludes the assignment of these components to either the Extended or Initial variants of the Coalescent tradition. Brushed bodysherds (actually parts of the vessel rim missing a lip) are most commonly found in Post-Contact Coalescent components in the area.

A major problem in assigning the components from the Big Bend area to specific variants is related to the apparent similarities of

Table J-11. Distribution of ceramic wares and types by site - Big Bend Project Area, East Bank (1978).

Site	Campbell Creek				Arzberger		Indeterminate	Site Total
	Pinched	Plain	Cord Roughened	Indented	Diagonal Incised	Plain		
39BF205	0	0	0	0	0	0	0	1
39HU5	0	0	0	0	0	0	0	8
39HU7	0	0	0	0	0	0	4	29
39HU52	0	0	0	0	0	0	1	4
39HU61	1	1	5	0	0	0	1	54
39HU62	0	0	0	0	0	0	1	3
39HU63	0	0	0	0	0	0	0	2
39HU83	0	0	0	0	0	1	1	5
39HU88	0	0	0	0	0	0	1	10
39HU97	0	0	0	0	0	0	10	143
39HU102	0	0	0	0	0	0	0	3
39HU126	0	0	0	0	0	0	4	29
39HU203	0	0	0	0	0	0	0	1
39HU204	0	0	0	0	0	0	1	26
39HU205	6	6	7	13	2	0	4	132
39HU206	0	0	0	0	0	0	0	4
39HU207	0	0	0	0	0	0	0	1
39HU212	2	0	0	0	0	0	0	3
39HU214	0	0	0	0	0	0	11	185
39HU216	0	0	0	0	0	0	0	1
39HU217	0	0	0	0	0	0	21	93
39HU218	0	0	0	0	0	0	0	1
39HU219	0	0	0	0	0	0	0	5
39HU220	0	0	1	0	0	0	0	6
39HU221	0	0	0	0	0	0	1	1
39HU242	2	0	3	1	0	1	1	8
39HU243	0	0	0	0	0	0	0	1
Total	11	7	16	14	2	2	62	759

Table J-11. Distribution of ceramic wares and types by site - Big Bend Project Area, East Bank (1978) (continued).

	Talking Crow				Stanley		Le Beau	
Site	Brushed	Indented	Impressed	Straight Rim	Plain	Tool Impressed	Horizontal Cord Impressed	Punctate
39BF205	0	0	0	1	0	0	0	0
39HU5	1	0	1	4	1	1	0	0
39HU7	0	0	0	9	0	0	0	0
39HU52	0	1	0	2	0	0	0	0
39HU61	0	0	0	13	0	0	1	0
39HU62	0	0	0	1	0	0	0	0
39HU63	0	0	0	0	0	0	0	0
39HU83	0	0	0	1	0	0	0	0
39HU88	0	0	0	0	0	0	0	0
39HU97	0	0	0	42	0	0	0	1
39HU102	0	0	0	0	0	0	0	0
39HU126	0	4	0	0	0	0	0	0
39HU203	0	0	0	0	0	0	0	0
39HU204	0	0	0	6	0	0	0	0
39HU205	0	0	0	27	0	0	0	0
39HU206	0	0	0	0	0	0	0	0
39HU207	0	0	0	1	0	0	0	0
39HU212	0	0	0	0	0	0	0	0
39HU214	1	5	0	28	0	0	5	0
39HU216	0	0	0	0	0	0	0	0
39HU217	1	15	4	40	0	1	1	0
39HU218	0	0	0	0	0	0	0	0
39HU219	0	0	0	1	0	0	0	0
39HU220	0	0	1	4	0	0	0	0
39HU221	0	0	0	0	0	0	0	0
39HU242	0	0	0	0	0	0	0	0
39HU243	0	0	0	0	0	0	0	0
Total	3	25	6	180	1	2	7	1

Table J-11. Distribution of ceramic wares and types by site - Big Bend Project Area, East Bank (1978) (concluded).

	Iona							
Site	Indented	S-Rim	Diagonal Incised	Horizontal Incised	Cadotte Collared	Unidentified-Iona or Grey Cloud	Grey Cloud Horizontal Incised	Cultural[a] Affiliation
39BF205	0	0	0	0	0	0	0	?
39HU5	0	0	0	0	0	0	0	PCC (Talking Crow Phase)
39HU7	7	1	3	0	0	3	2	EC
39HU52	0	0	0	0	0	0	0	?
39HU61	0	5	1	0	0	10	16	IC/EC
39HU62	0	0	0	0	0	1	0	EC?
39HU63	0	0	1	0	0	0	1	EC?
39HU83	0	0	0	0	0	2	0	IC?
39HU88	0	7	0	0	0	0	2	EC
39HU97	8	17	0	1	0	16	48	EC
39HU102	2	0	0	1	0	0	0	EC?
39HU126	7	2	0	6	1	0	5	EC
39HU203	0	0	0	0	0	1	0	?
39HU204	6	2	0	8	1	2	0	EC
39HU205	9	14	0	1	0	12	31	IC
39HU206	1	1	0	0	0	1	1	EC?
39HU207	0	0	0	0	0	0	0	?
39HU212	0	0	0	1	0	0	0	IC?
39HU214	9	15	0	27	0	21	63	EC
39HU216	0	1	0	0	0	0	0	EC
39HU217	2	1	3	0	0	2	2	PCC (Talking Crow Phase)
39HU218	0	1	0	0	0	0	0	?
39HU219	2	0	0	2	0	0	0	EC
39HU220	0	0	0	0	0	0	0	IC?
39HU221	0	0	0	0	0	0	0	?
39HU242	0	0	0	0	0	0	0	IC
39HU243	0	0	0	0	0	0	1	?
Total	53	67	8	17	2	71	172	

[a]Based on an analysis of rimsherds and bodysherds. ? = Indeterminate; IC = Initial Coalescent; EC = Extended Coalescent; PCC = Post-Contact Coalescent.

Table J-12. Distribution of bodysherds by site - Big Bend Project Area, East Bank (1978).

Site	Simple stamped	Cord roughened	Brushed	Smoothed	Decorated	Indeterminate	Total
39BF58	1	0	0	0	0	0	1
39BF205	0	0	0	1	2	5	8
39HU5	6	0	4	17	1	27	55
39HU7	63	0	0	71	44	250	428
39HU52	6	0	0	7	6	20	39
39HU61	103	82	1	111	148	596	1041
39HU62	7	0	0	2	12	31	52
39HU63	8	0	0	5	9	23	45
39HU83	2	1	0	2	10	20	35
39HU88	13	0	0	3	20	43	79
39HU95	2	3	0	0	0	10	15
39HU97	443	0	0	168	317	2344	3272
39HU102	7	0	0	1	5	21	34
39HU114	1	0	0	2	1	0	4
39HU115	0	0	0	0	1	0	1
39HU126	132	1	0	35	107	388	663
39HU132	1	0	0	0	1	1	3
39HU202	0	0	0	1	1	2	4
39HU203	3	0	0	0	6	10	19
39HU204	144	1[a]	0	49	156	65	415
39HU205	176	205	1	128	128	50	688
39HU206	7	0	0	5	7	38	57
39HU207	0	3	0	1	1	0	5
39HU210	0	1	0	0	1	4	6
39HU212	0	6	0	2	1	26	35
39HU214	241	0	0	100	210	203	754
39HU216	2	1	0	0	1	28	32
39HU217	232	0	8	36	15	7395	7686
39HU218	5	0	0	1	2	17	25
39HU219	17	0	1	11	20	34	83
39HU229	0	0	0	0	1	0	1
39HU231	2	0	0	1	0	17	20
39HU233	0	0	0	0	0	1	1
39HU242	6	79	0	4	0	29	118
39HU243	0	1	0	0	2	1	4
Total	1630	384	15	764	1236	11699	15728

[a]This cord roughened sherd is of Woodland origin (cn no. 687).

Initial and Extended Coalescent ceramic assemblages. A mix of Talking Crow Straight Rim, Grey Cloud Horizontally Incised, Iona, Campbell Creek and Arzberger types is usually found in Initial Coalescent assemblages. Campbell Creek and Arzberger wares are generally not found in Extended Coalescent components. Initial Coalescent pottery can have simple stamped or cord roughened bodies. The former surface treatment is characteristic of Extended Coalescent pottery. Therefore, the components which contain either cord roughened bodysherds and Campbell Creek/Arzberger types in sufficient quantities are assigned to the Initial variant of the Coalescent tradition. A question mark is inserted along with the taxonomic assignment if the sample size is too small to permit a firm assessment. Components which contain Iona Ware, Talking Crow Straight Rim and Grey Cloud Horizontally Incised in addition to the other wares (excluding Campbell Creek and Arzberger) and characterized by simple stamped bodysherds (excluding cord roughened bodysherds) were assigned to the Extended variant of the Coalescent tradition. Extended Coalescent components also have relatively high frequencies of decorated bodysherds as compared to other Coalescent variants. If sample sizes are small, I am uncertain if the absence of pottery characteristic of Initial Coalescent components (i.e. cord roughened bodysherds, Campbell Creek and Arzberger wares) is due to this fact or that the samples are actually from Extended Coalescent components. Therefore, a question mark is inserted after the Extended Coalescent acronym (EC) in the table. The ceramic samples from some components are too small and undiagnostic to permit a specific taxonomic assignment. These components are noted by a question mark (?) under cultural affiliation.

VOLUME III
APPENDIX 1

GEOLOGICAL SITE REPORTS FOR EIGHT LOCATIONS WITHIN THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA

SECTION K

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APPENDIX 1, SECTION K

GEOLOGICAL SITE REPORTS FOR EIGHT LOCATIONS WITHIN THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA

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INTRODUCTION

This section provides consideration of geological and geomorphological characteristics for eight site locations within the Lake Sharpe (Big Bend) Project area. Reports are based on field investigations completed during the 1978 and 1979 seasons. Presentations are organized on a site-specific basis with primary attention given to establishing a reasonable context within which identified archeological remains may be evaluated.

THE RATTLESNAKE SITE
(39BF41)

The Rattlesnake Site (39BF41) is located on the shore of an unnamed inlet of Lake Sharpe in Section 24. The site was evaluated through a bank profile and one test in the summers of 1978 and 1979.

GEOLOGICAL HISTORY OF THE SITE AREA

A partial geological history of the site area is displayed in cut-banks along the inlet to the west of the bank profile proper. A survey of the area was made in 1978 and 1979 (Figure K-1). The section at "J" (Figure K-2) is helpful in understanding the sequence of geological events which took place in the development of the section exposed by the bank profile. This sequence is summarized in Table K-1. The sequence shows several episodes of erosion and deposition during the late Pleistocene and Holocene. The most important of these is the downcutting of a gully into the underlying Pleistocene gravels and the filling of this gully with slope wash and aeolian sand and silt during the Holocene because the cultural horizon at 39BF41 is located in the fill of a gully similar to that shown on Figure K-2, Units E and F.

RELATIONSHIP OF CULTURAL HORIZON AT 39BF41 TO SEQUENCE DISPLAYED AT SECTION "J"

The cultural horizon buried some 200cm below the surface (Figures K-3 and K-4) at 39BF41 is sedimentologically part of the sequence of gully filling similar to Units E-F-D at Section "J". As one views the site of 39BF41 from a distance one sees a small knoll with a bank cut by the erosion along Lake Sharpe. On each side of the knoll are small, modern gullies. What is not superficially obvious is the absence of the underlying Pierre Shale which has been cut away

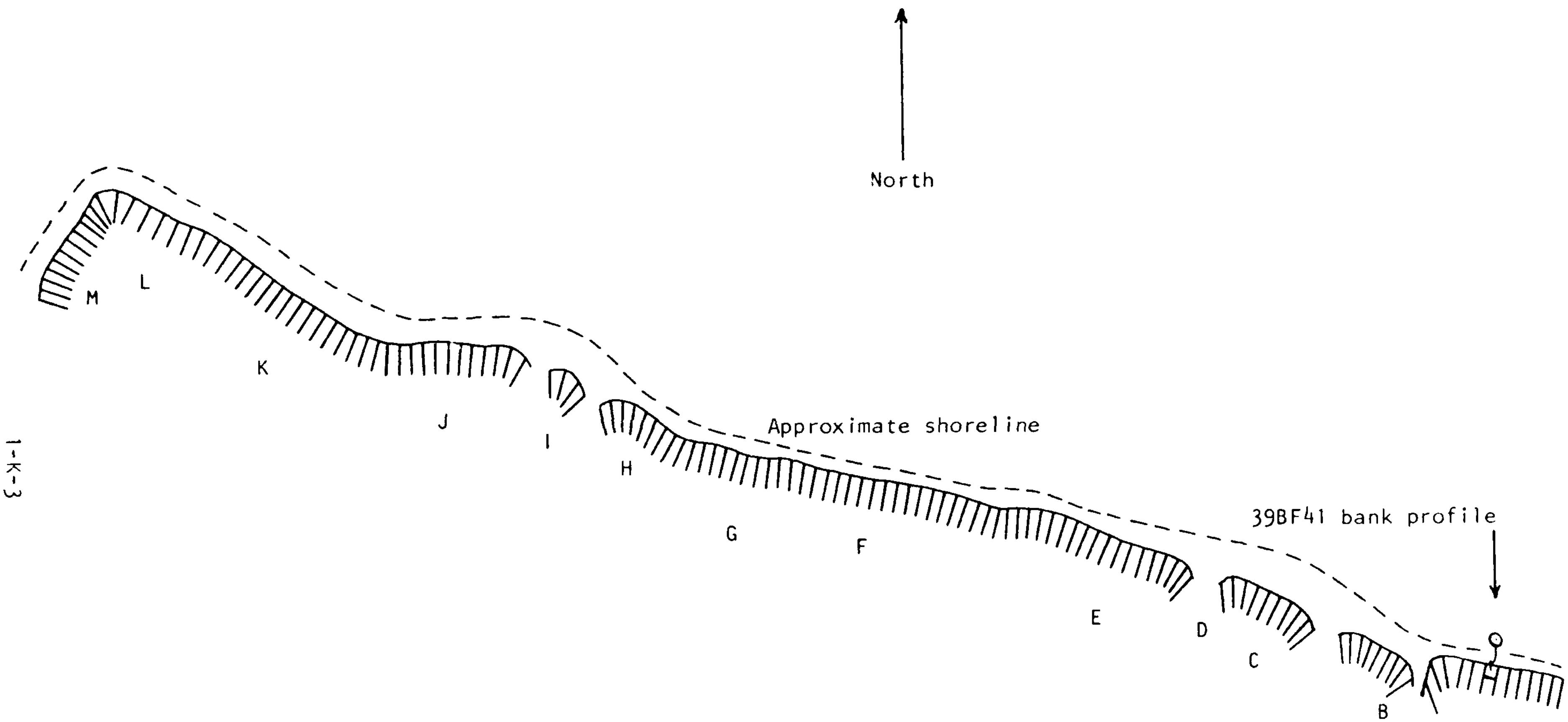
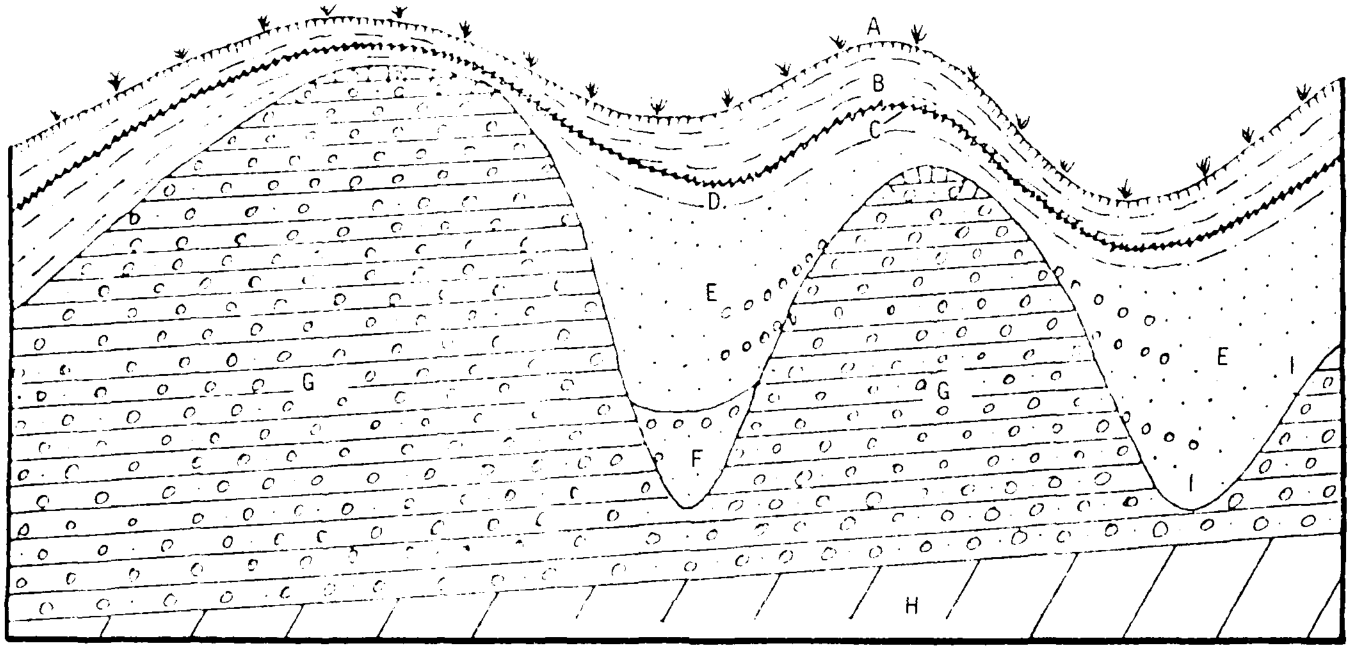


Figure K-1. Survey sketch map along the shore of the inlet of Lake Sharpe showing the location of the bank profile and key observation points.



Key: A = surface of MT-2. B = upper silt cap. C = paleosol in silt cap. D = silty fill of underlying gully. E = sandy fill of gully with some gravelly slope wash. F = gravelly fill of gully. G = glaciofluvial gravels (Pleistocene). H = slumped. I = erosional surface of gully in Pleistocene glacifluvial gravels.

Figure K-2. Geological sketch of the bank at "J" (view south). Description of events is given in Table K-1.

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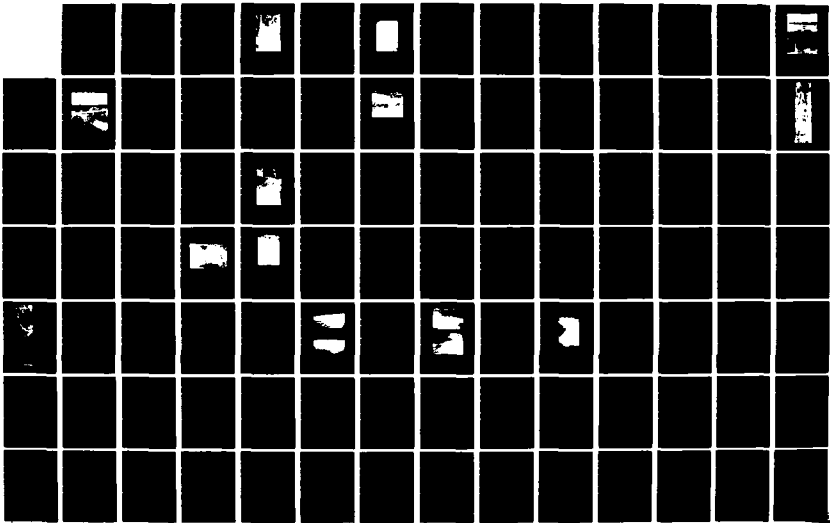

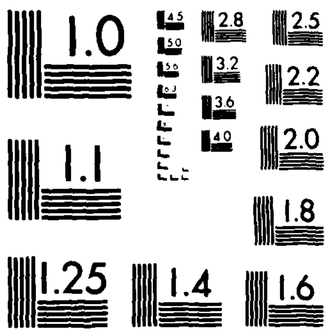
1.0
4.5
5.0
5.6
6.3
2.8
2.5
3.2
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2.0
1.1
1.8
1.25
1.4
1.6

Table K-1. Sequence of geological events evident in bank profile at locality "J".

1. Erosion of valley into the underlying Pierre Shale, not shown in the Figure.

2. Deposition of MT-2 fill of glaciofluvial gravel, dipping to the east to heights of about 1,455 ft. (Unit G).

3. Erosion and gullying of MT-2 surface forming the surface at I and below F. This gully forming episode is interpreted as Holocene.

4. Development of a heavily ironstained surface on the glaciofluvial gravels, especially at the tops of the small hills separating the gullies.

5. Surface wash filling of the gully with additions of aeolian silt and sand (Units F, E and D).

6. Formation of paleosol (C) over the whole of the sequence conforming to the underlying topography of hills and gullies. Probably late Holocene.

7. Continued deposition of windblown silt (Unit B).

8. Erosion of new gullies which appear to cut out unit C, i.e. late Holocene to modern gully formation.

9. Formation of modern soil on surface of Unit A.

Note: The cutting of surface I in this section is not well dated. It could be as early as late Pleistocene or early Holocene and as late as late Holocene. At Walth Bay (39WW203), early erosion of the glaciofluvial gravels is before 8000-10,000 B.P.; here it could be as late as late Holocene. In the alternative, the younger erosion could have occured following the gullies of the earlier erosion. The cultural layer at the bank profile is at a level approximately equivalent to the surface between E and F in this diagram.

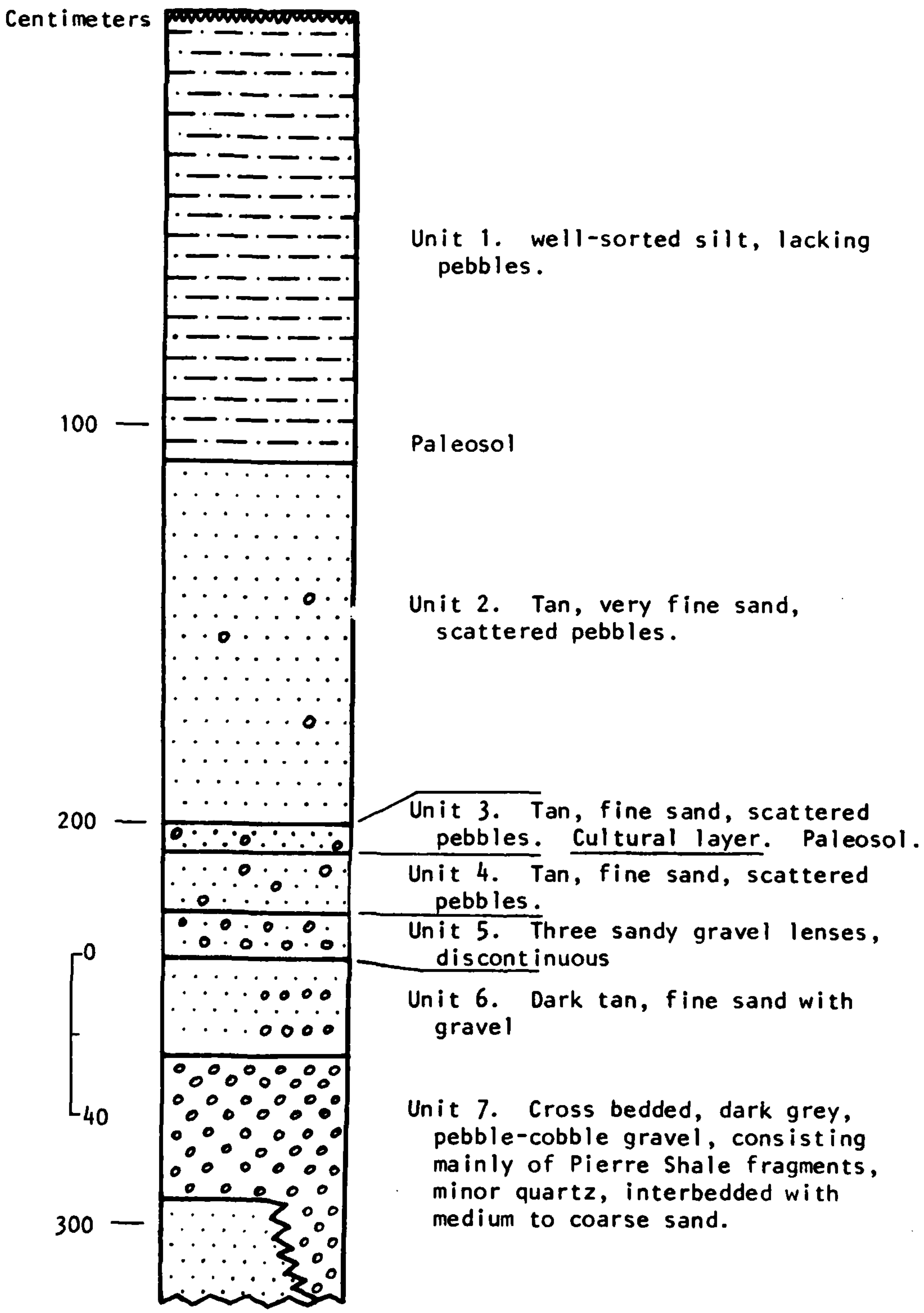


Figure K-3. Bank profile at the Rattlesnake site (39BF41) with description of seven units.

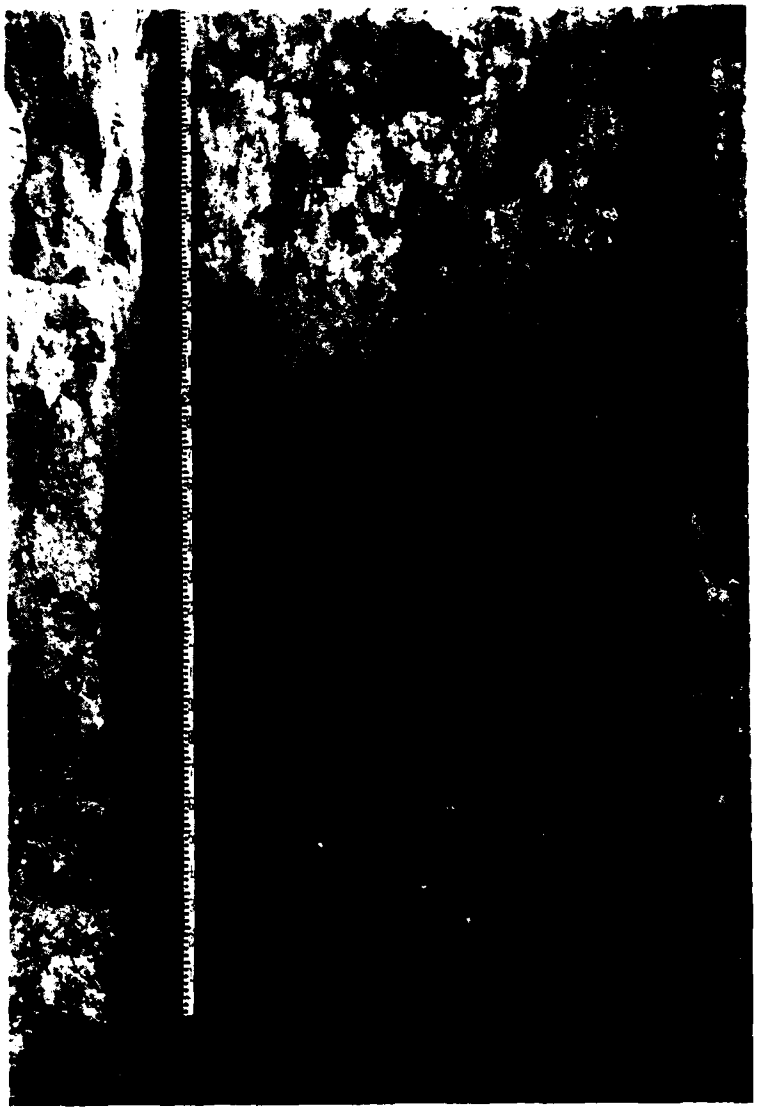


Figure K-4. Photograph of the bank profile at 39BF41.

to form the valley into which all the later material has been deposited. Also not immediately obvious is the lack of Pleistocene gravels, here often steeply dipping, which underlie the later Holocene sand and silt with its paleosols (compare Figures K-3, K-4). A more complete section (M) of the sequence without obvious erosional events is displayed at the corner of the inlet where one sees the glaciofluvial gravels high in the bank of MT-2 along the edge of Lake Sharpe, overlain by vertical cliffs of sand and aeolian silt (Figure K-5).

The cultural horizon at 39BF41 is buried in fine sand with scattered pebbles, the latter probably buried as colluvial slope wash from the still uncovered surface of MT-2 upslope from the site. The horizon was subsequently buried by mainly colluvial sand and windblown silt. Although the thickness of the deposit overlying the cultural horizon is not of itself indicative of substantial age, the series of events in the sequence described at "J" and comparison of these with the general summary of Holocene events in the Big Bend area serve as a basis for estimating the age of the materials. The sparse archeological materials are consistent with a preceramic site.

The gully which was filling at the time of occupation, now described as Unit 3 (Figure K-3), could have been cut at one or more times since the Pleistocene. The periods of primary erosional events are thought in general to have been in the Late Wisconsin-early Holocene, and several times during the late Holocene (Figure K-6). Sites dated at Walth Bay and Rousseau serve as a partial basis for the summary diagram of erosional and depositional regimes. The major question is whether the cultural layer is part of the filling of a gully formed in the early Holocene and is overlain by aeolian sediment and slope wash of the middle Holocene or whether the cultural layer is part of a filling of a gully formed in the late Holocene and covered by later Holocene deposits. If the latter, where might it best fit in the late Holocene sequence?

It is relevant to these questions to note that no early Holocene paleosol is recognized in the deposits and that the gravels which underlie the site and which are cemented and dipping are most surely

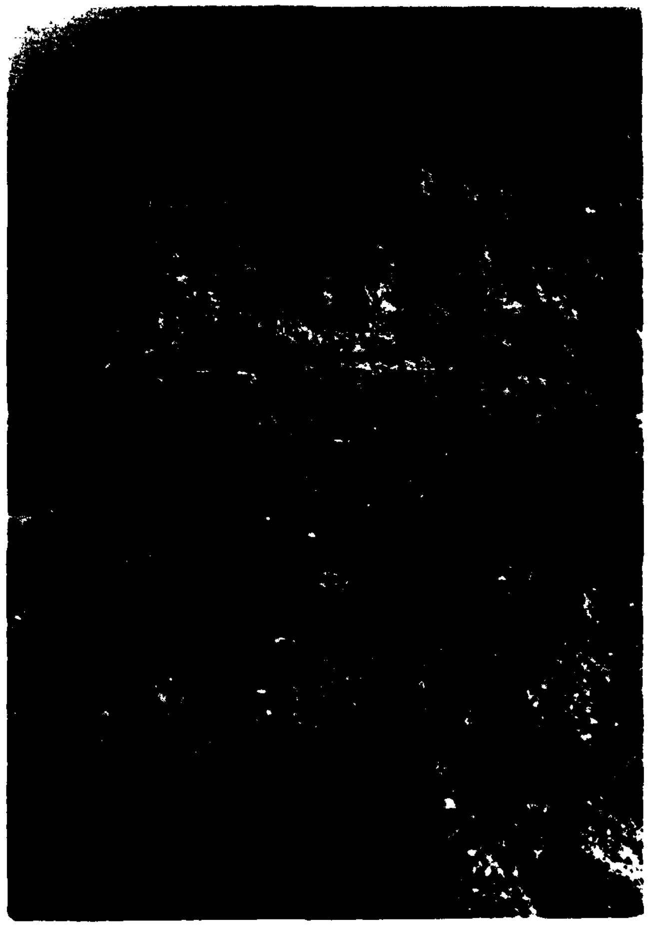


Figure K-5. Photograph of the bank at point M (Figure K-2) showing the Pleistocene glaciofluvial gravels halfway up the section and cliff forming Holocene silt at the top.

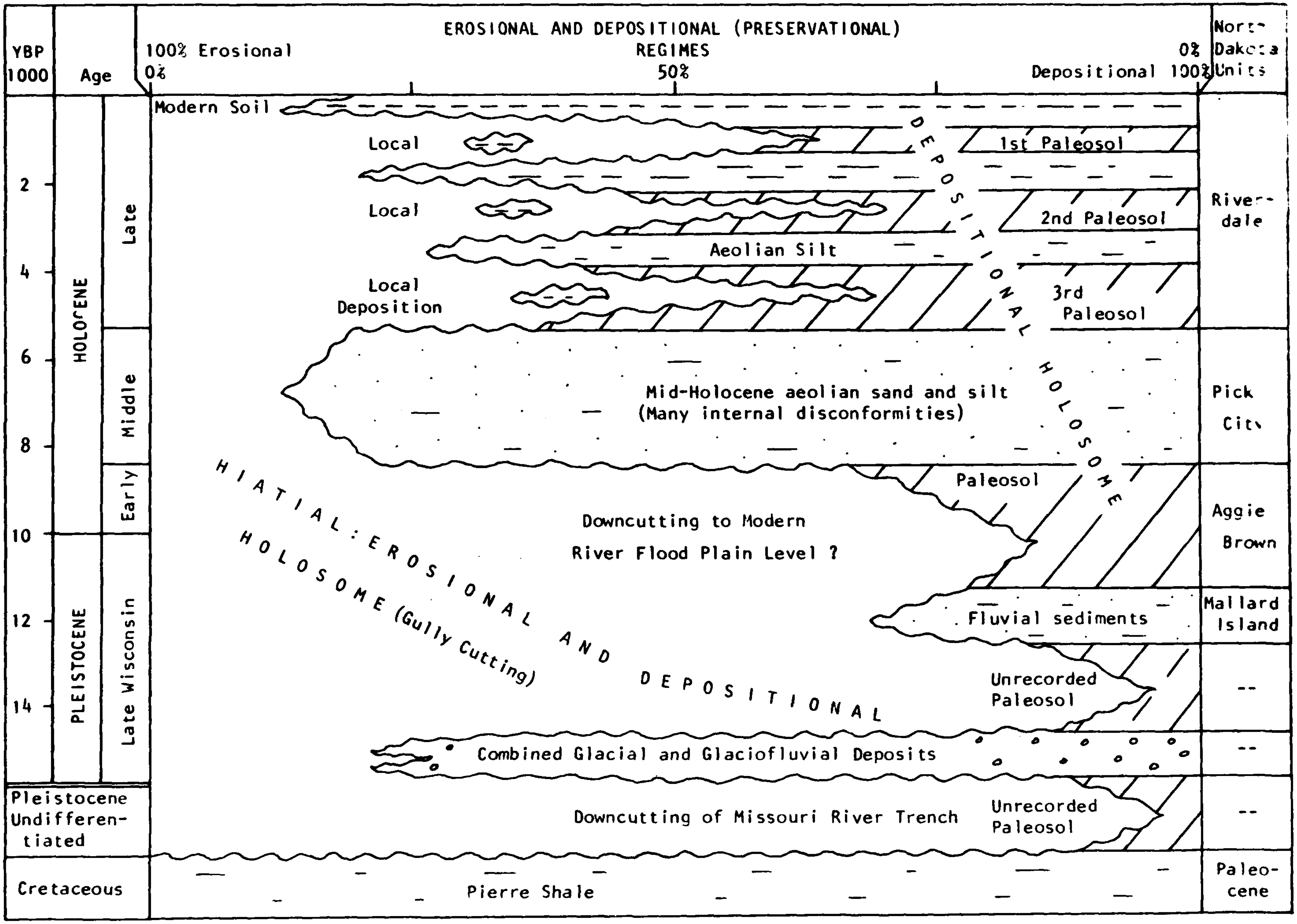
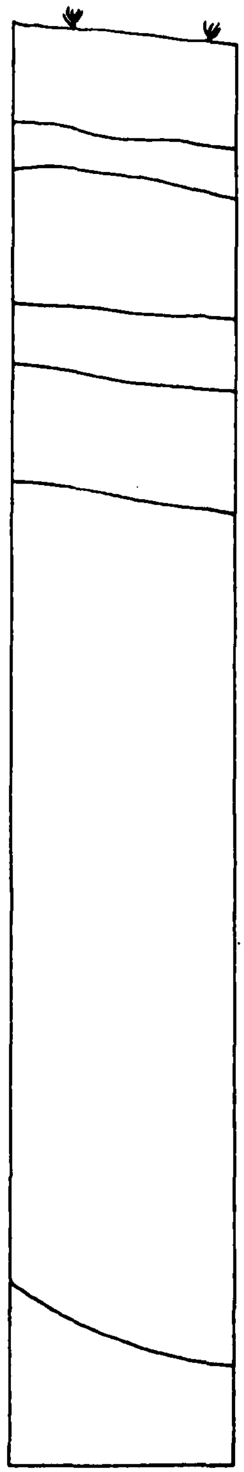


Figure K-6. Erosional and depositional (preservational) regimes in the late Pleistocene and Holocene strata of the Big Bend area.



1. Brown, very fine grained sandy loess.

2. Light brown, very fine grained sandy loess.

3. Brown, very fine grained sandy loess.

4. Grey-brown, very fine grained sandy loess with small amounts of caliche.

5. Yellow-tan, very fine grained sandy loess.

6. Tan, very fine grained sandy loess with caliche and small amounts of gravel. Amount of gravel increases towards the bottom of unit.

7. Same as Unit 6, moderate amounts of gravel.

Figure K-7. Diagram of Test 1, South Wall profile showing the sequence of Units 1-7.

glaciofluvial outwash of the Pleistocene. These facts would be consistent with an interpretation of an early Holocene gully formation filled with middle Holocene aeolian deposits over the cultural layer. On the other hand, it is known from the Rousseau site (this report) that gully formation took place in the interval of time previous to 3300-3900 B.P. and that several feet of aeolian sand and silt and slope wash could be deposited during the late Holocene. Note too that the upper portions of the bank profile (Figures K-3, K-4) contain one additional paleosol (depth about 100cm) and that the cultural materials appear also to be concentrated (with bone) in a faint paleosol.

Comparison of these facts with the situation at Rousseau suggests that the preceramic cultural layer at the Rattlesnake site is in a similar position and should date from about 2000-3500 B.P., that is during the time of formation of either the so-called second or third paleosol, as is shown in Figure K-6.

CORRELATION OF BANK PROFILE WITH TEST 1

Test 1 was escavated after the geological field season, and yielded a single flake. Based on test profiles (Figure K-7), a correlation of the test pit and bank profile is suggested in Figures K-8, K-9.

The correlation suggests that the upper paleosol (Unit 3 of Test 1 and 1a of the bank profile) are the same and parallel the present surface (Figure K-9). The second paleosol and cultural level horizon appears to be cut out or absent in Test 1. Note that Test 1 lies 2m deep. Nevertheless, Test 1, based on the correlation, should have intersected the same cultural horizon in the base of test Unit 6--had it been present in abundance at that place (see Figure K-8).

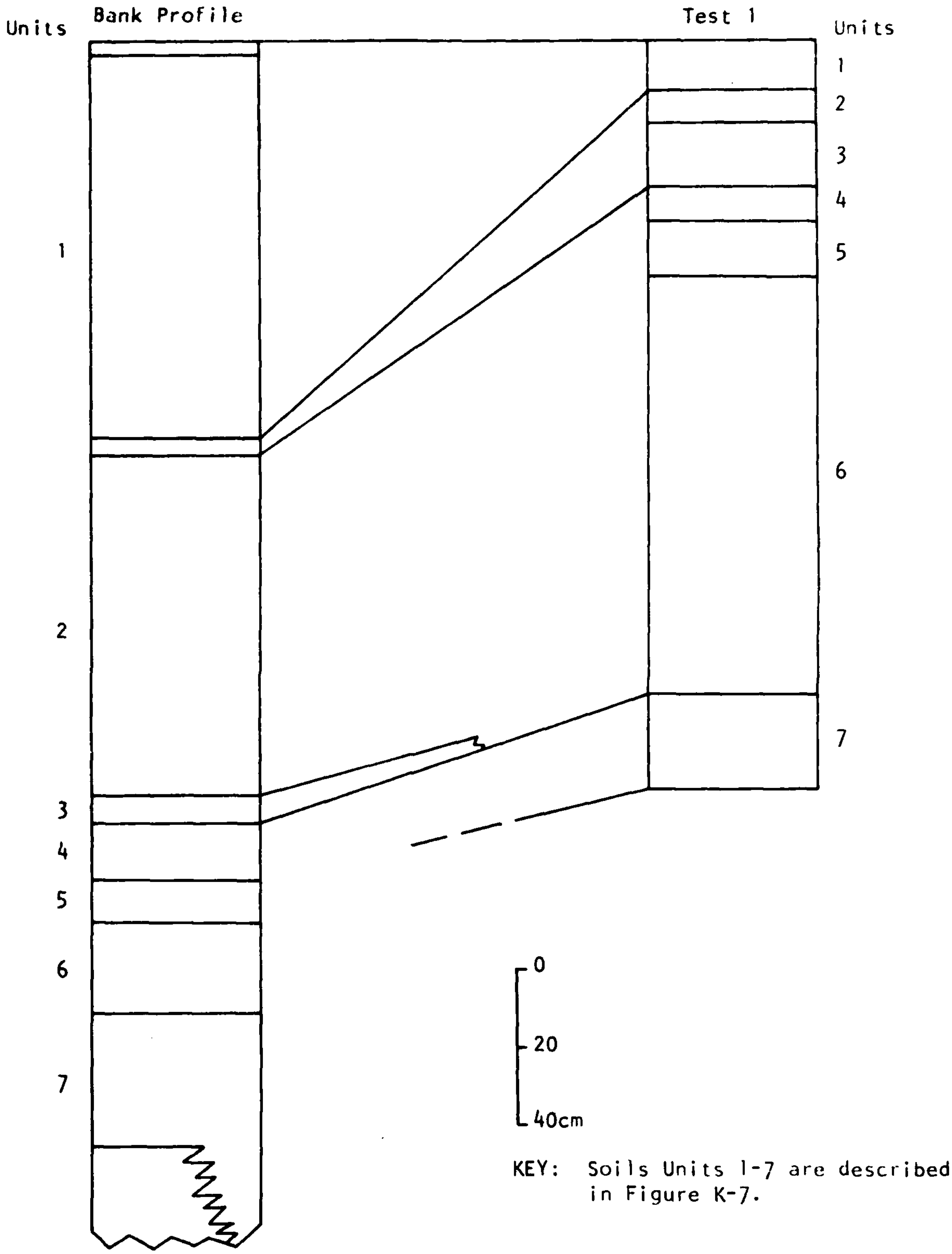


Figure K-8. Correlation of the Test 1 and bank profiles showing the correspondence of recognized units.

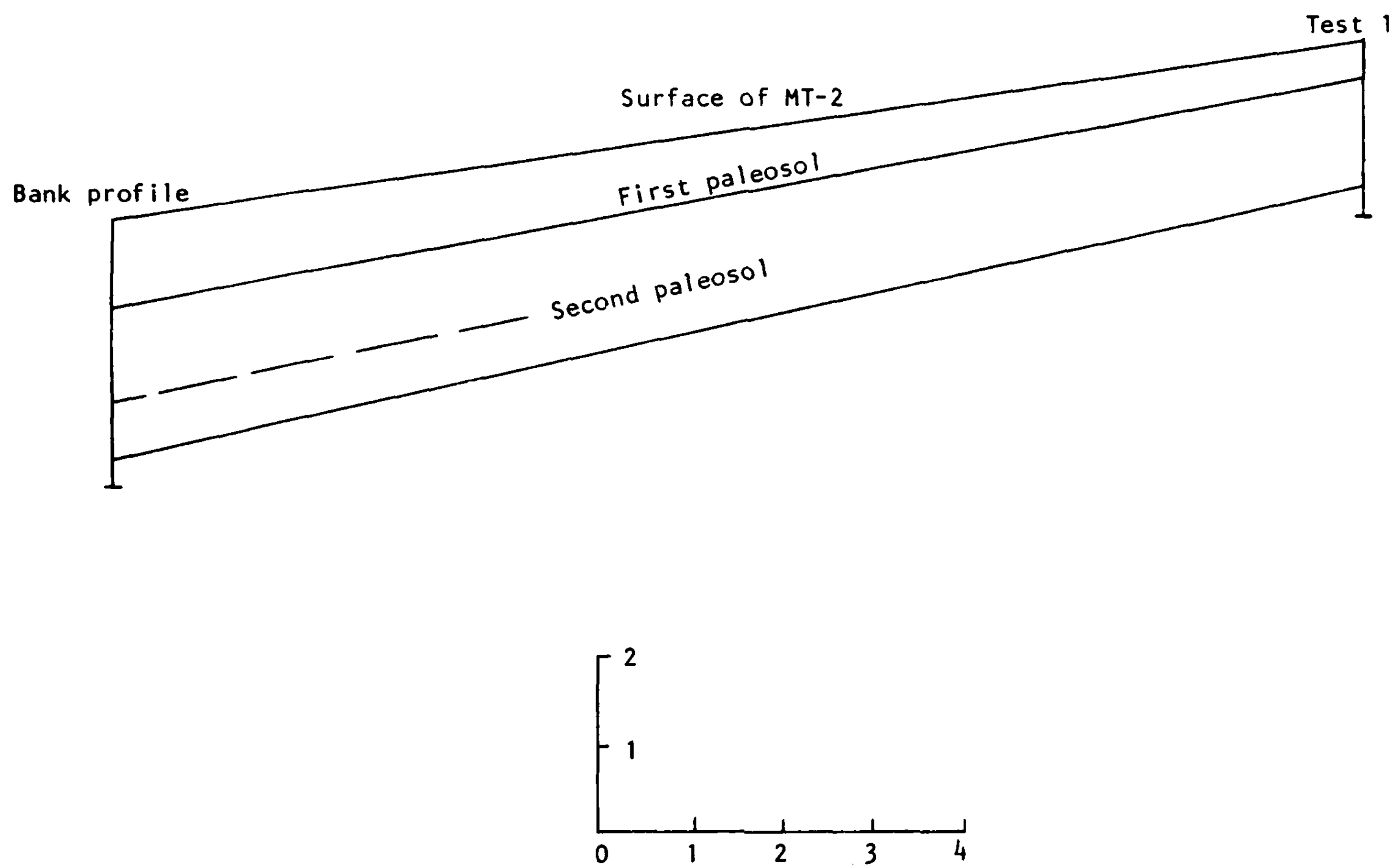


Figure K-9. Correlation of units shown in part in Figure K-11 at a 1:1 scale.

THE SMITH BEAR SITE
(39BF42)

The Smith Bear site is located in a small embayment of Lake Sharpe (Figure K-10A). The surrounding hills consist of bedrock Pierre Shale mantled with a small amount of glacially derived material. The site is at a position where it would have been in the bowl of the upper portion of a small stream cut into MT-2 near the junction of MT-2 and MT-3 before lateral erosion of the left bank of the Missouri River and inundation of the lower part of the valley by the waters of Lake Sharpe.

The bank profile consists of only a few feet of what had been the silt-covered sides of the valley before the Fort Thompson Dam was built (Figure K-10B). When wet, the silt has a uniformly black muddy appearance, without structure or distinguishing characteristics.

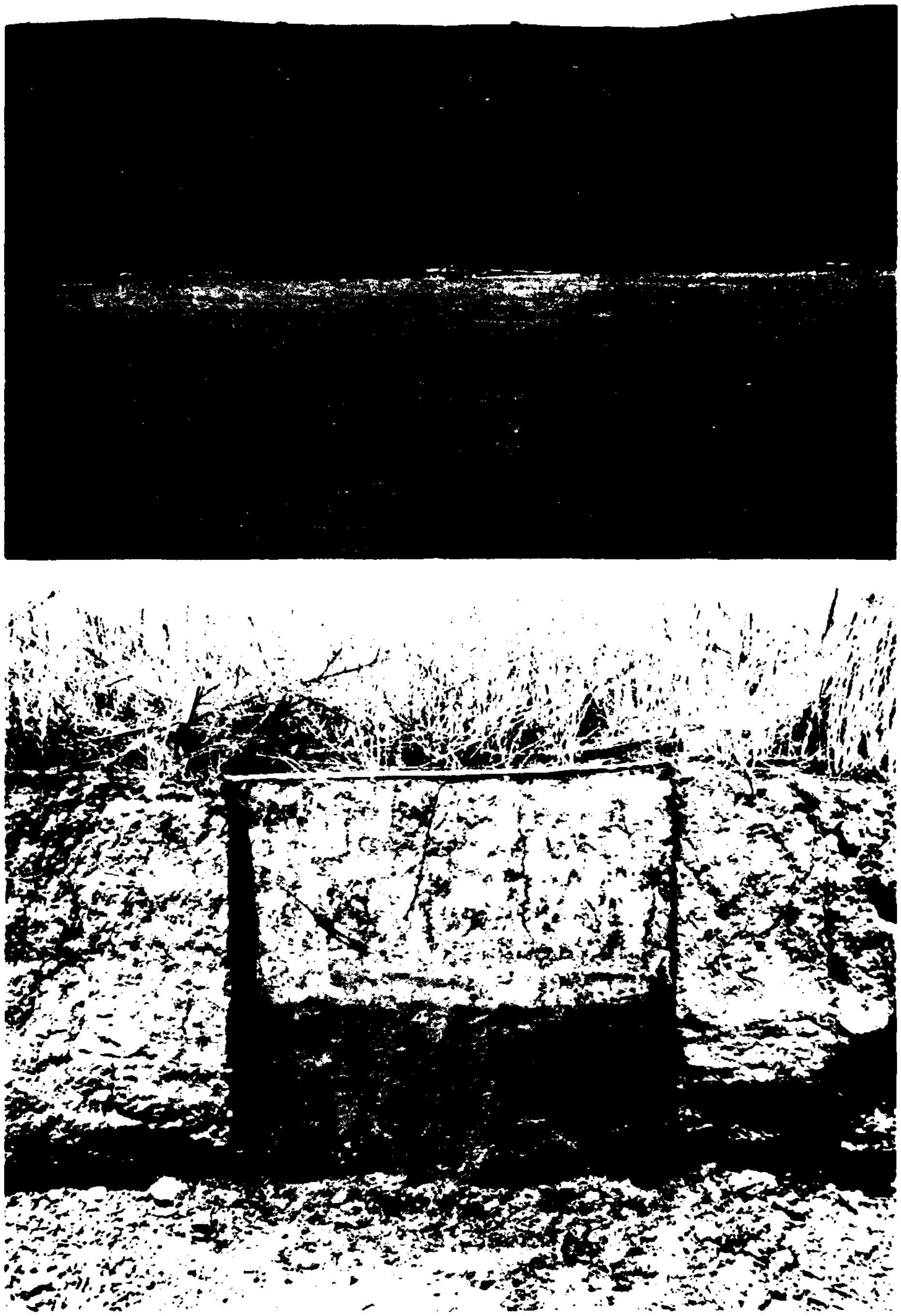
The site is noted for its lithic scatter. It is situated in a position where it could have been an upland hunting site close to tool making material, but sheltered along an intermittent stream, possibly spring-fed from the contact between the glacial materials and the Pierre Shale.

Test 1, excavated to a depth of about 40cm, is about 20m uphill from the bank. The test appears to be entirely in the late Holocene silt cap. Test 2, excavated to a depth of about 50cm, appears to be the same. In both cases, the dark brown-black clay of unit three may be a paleosol or a clayey slope wash from the higher black Pierre Shale. Test 3, also excavated to a depth of about 50cm, shows a similar sequence.

None of the tests were open when I was in the field. In addition, the bank profile (Figure K-10B) was thoroughly wet during the inspection and was describable only as the black mud cited above. Inspection of field photographs indicates that there is some parallel bedding in the section, but its significance is not known.

Nothing in the geological setting is contrary to the conclusion that the site is probably of fairly recent age. The sparse geological data would suggest an outside age of 1000 B.P.

A



B

Figure K-10. A) Photographic view east toward the embayment of Lake Sharpe in an old stream valley heading on the lower slopes of MT-3 and cutting into MT-2. The site is in the center lower portion of the photograph and the bank profile near the accumulation of logs. B) Bank profile at wave cut bench in the embayment. The lower dark portion is typical of wetted loess.

THE SOLDIER CREEK SITE
(39BF237)

The Soldier Creek site is located on the slope of the MT-2 terrace (Fort Thompson terrace) on the slope of the hillside overlooking the southeast side of Soldier Creek by the cemetery and approximately 2m below the nearby surface of MT-2 (Figure K-11A). A single test was excavated to a depth of about 100cm.

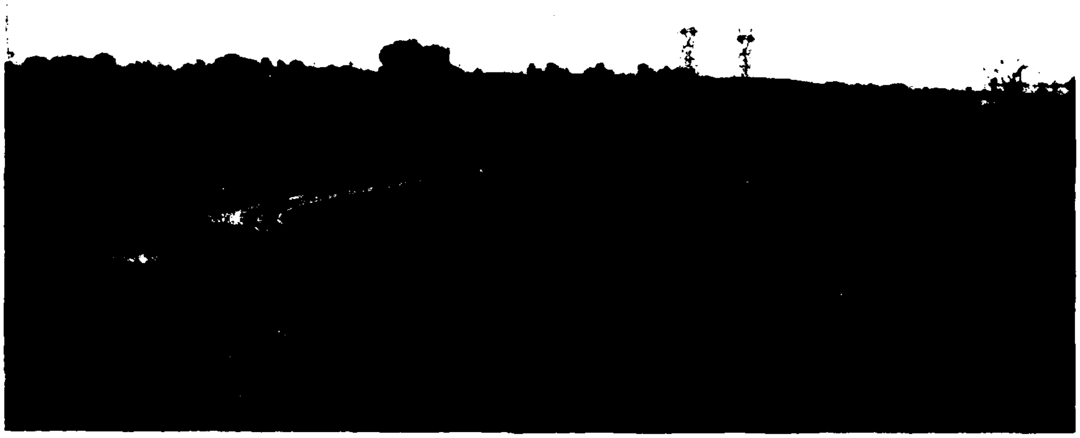
STRATIGRAPHIC SECTION

Generally, the upper 40cm of the test consists of windblown silt and fine sand. There are no humic stabilization zones observable, other than the present surface soil horizon. There is a moderately well developed "B" soil horizon with a substantial number of white "caliche" specks (Figure K-11B). The sand and silt appear to be locally derived and the sand grains which are mixed with the silt show evidence of wind abrasion. Three units were distinguished in the upper 40cm, based on amount of sand present and other minor characters of the sediment (Figure K-12).

Unit 4, between about 41cm and 75cm below the surface, consists of mixed colluvial sand and silt without pebbles. Minor "caliche" specks are present as are animal burrows with a coarser sand matrix.

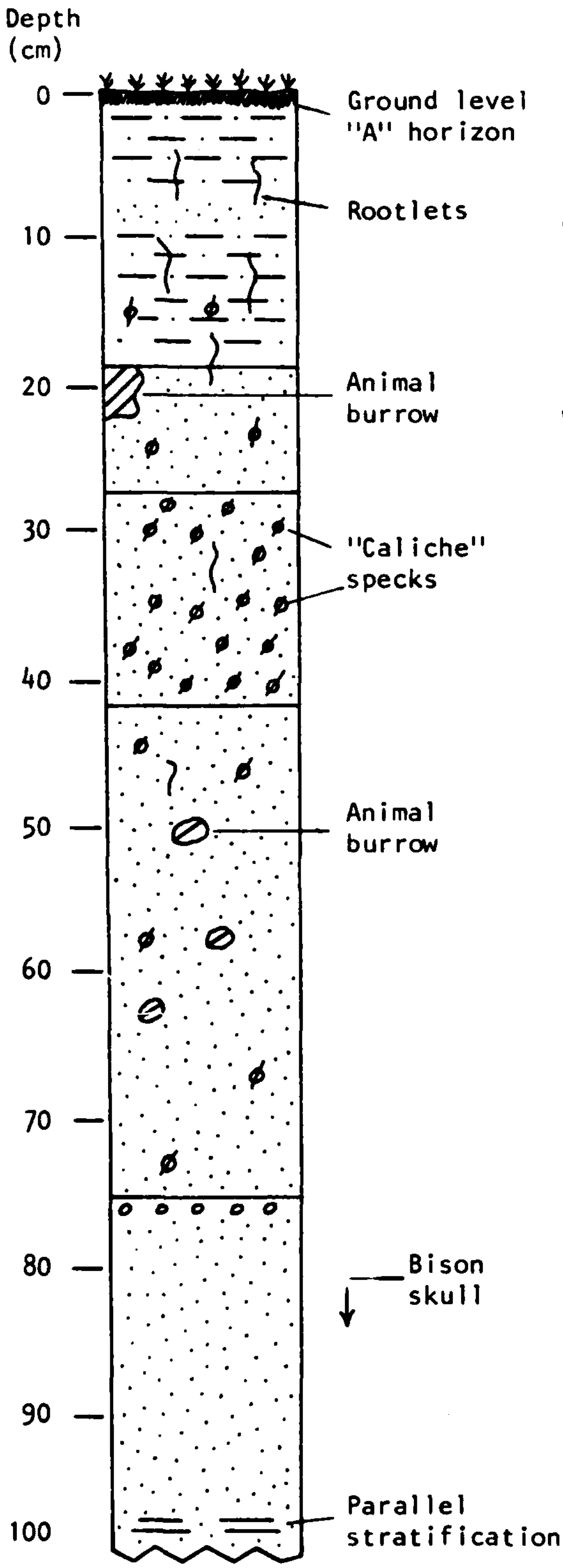
Unit 5, below 75cm, consists of well-sorted quartzose and lithic sand topped by a pebbly stratum which represents a colluvial stabilization horizon. The pebbles are interpreted as having been derived from the exposed surface of MT-2 at a slightly higher elevation. A bison skull was removed from below this stabilization horizon and consequently can be considered to have been "in place". Between 95-100cm below the surface, there are faint indications of parallel stratification in the medium to fine sand.

A



B

Figure K-11. A) View across Soldier Creek below the Fort Thompson Dam toward site 39BF237 in the far ground on line with the left of the two power lines. The terrace level in the far ground is MT-2. The terrace level to the right foreground is CMT-1. The main flat in Soldier Creek is CMT-0. B) Photograph of Profile 1 showing the multiple caliche layers. The profile as exposed is about 4 ft. deep.



Unit 1. Tan-buff silt containing 30-40% fine to medium sand (quartz and rock fragments). Rootlets prominent to depth of 25cm. White specks of caliche (?) from 10-28cm depth.

Unit 2. Light tan, fine-medium sand with 15-25% silt, sand quartzose and fine rock fragments. Animal burrow contains coarse to medium sand. Sand grains "frosted".

Unit 3. Light tan silt, sand 25-35% as above. White "caliche" specks over 30-40% of surface of cut, "B" soil horizon.

Unit 4. Light tan, medium to fine grained sand, quartzose, and minor rock fragment sand, well sorted. Minor rootlets to 80cm depth. Few animal burrows with coarser sand matrix in them. No noticeable white specks below 75cm; few between 41-75cm depth. Silt less than 10-15%.

Unit 5. Buff to light tan, well sorted, quartz and lithic (rock fragment) medium to fine grained sand. Pebbly stratum at top of Unit 5. At bottom of Unit 5 sand is parallel bedded.

Figure K-12. Description of the section at Profile 1. Although Unit 5 has a lithological composition consistent with the middle Holocene aeolian deposit, it is also possibly derived from nearby sandy sources and may be younger.

INTERPRETATION

The lower units, 4 and 5, were derived from a redistribution of sand deposited as the terrace fill of MT-2--either as colluvial slope wash from slightly higher ground or as a combination of this and windblown material from the top and slope of MT-2. The bison skull removed from Unit 5 was covered by a colluvial layer of pebbles derived from the exposed gravels of the terrace fill of MT-2. There is no physical evidence from the test of disturbance or mixing of the materials in Unit 5 after the deposition of the pebble layer.

The upper three units, 3, 2 and 1, were deposited as windblown sand and silt. The windblown material was derived both from the flood plain of the Missouri River and mouth of Soldier Creek, as well as from exposed surfaces on the top and slope of MT-2 at and above the site. Subsequently, the present soil layer developed and the white caliche specks were deposited to a depth of 75cm, although some of these may represent "B" zone accumulation related to earlier surface soil horizons which have been removed.

The absence of humic horizons below the present soil surface at this site indicates wind and slope wash deposition and erosion during the period of deposition of the deposits making up units 1, 2 and 3.

There is limited evidence of geological-climatological events in the test section which would serve as a basis for an estimate of considerable age for the bison skull. It is reasonable to assume that much more sediment would have been deposited and preserved over the bison skull had the site not been in a position where erosive forces were also active. Consequently, the more than three-quarters-of-a-meter of sediment overlying the bison skull is not of itself indicative of great age. All or most of the sediment could have been deposited relatively recently. The best current estimate, based on sedimentological processes and the geomorphological position of the site, is that the bison skull was covered by slope sediment between several hundred and one to two thousand years ago. Comparison of the

Soldier Creek section with the generalized model of late Holocene deposition and erosion (Coogan 1980) adds little to the interpretation. The site's location near the historic edge of the terrace above the Missouri River and Soldier Creek appears to have been favorable for both erosion and deposition by the wind and provides few natural stratigraphic clues to age through the recognition of water cut erosion surfaces or paleosols.

THE BIG HAND SITE
(39BF238)

The Big Hand site (39BF238) is located on a sloping surface of the Fort Thompson terrace (MT-2) at an elevation of approximately 1,450 ft., and approximately 150 ft. from Lake Sharpe and 200-250 ft. west of a small draw (Figure K-13). A pumping station is maintained in the draw.

STRATIGRAPHIC SECTION

A single test was dug to a depth of about 120cm. The upper 70cm consists of aeolian silt with colluvial pebbles; from 70-100cm there is fine sand with pebbles and an occasional cobble interpreted as a mixture of windblown and colluvial materials. The description of the test section is shown in Figure K-14.

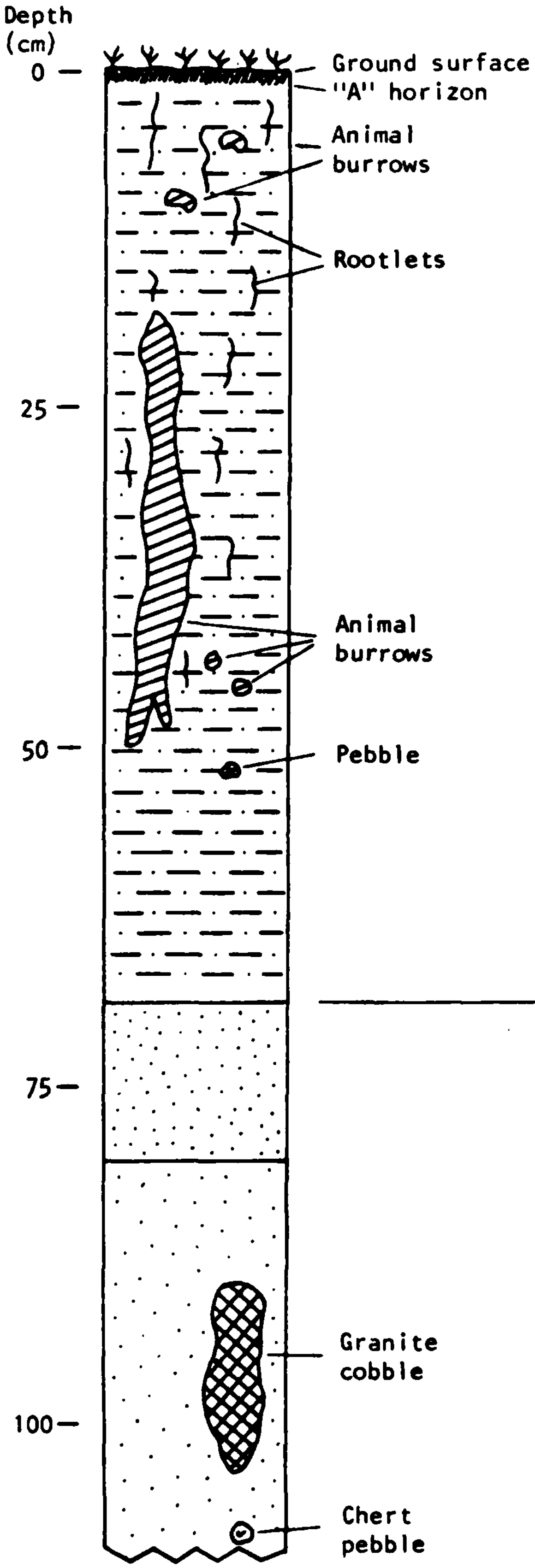
INTERPRETATION

Examination of the test and the surrounding area, especially along the shore of Lake Sharpe, demonstrates that the location of the test is on the terrace of the Missouri River designated as MT-2. Profiles along the shore below 39BF238 show that there is a strath terrace in the Pierre Shale at elevations about 1,435 feet. This river valley terrace is covered at higher elevations by Pleistocene glaciofluvial gravels and Holocene sand and silt. However at the shoreline earlier downcutting of the river exposed the bedrock Pierre Shale which was subsequently thinly covered by silt and colluvial sand and some pebbles on what was the lower slope of MT-2 (Figure K-15).

The site, although yielding no artifacts, displays a section which is commonly found on the sloping surface of MT-2, having a moderately thick (greater than 2m) cap of fine silt and sand.

Lack of clear stabilization zones in the section indicates that erosion and deposition were proceeding intermittently on the slope and

Figure K-13. Aerial photographic view of the left bank of Lake Sharpe including the road from Fort Thompson, the site of Medicine Crow (39BF2) indicated by the dark circles of house sites and the gullies of fairly recent erosion of the edge of MT-2.



Upper unit

Yellowish-grey to light brown silt with less than 10% fine to medium sand, very well sorted.

Uppermost later is "A" soil horizon. Upper unit contains vertical grass rootlets and animal burrows containing coarser sand.

Below 40cm, occasional pebbles are present and rootlets are less common.

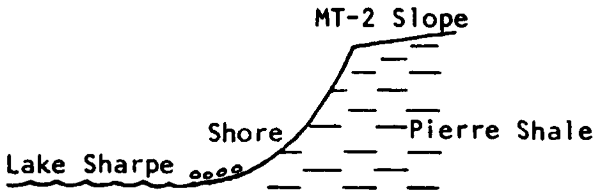
Lower unit

Buff to tan, fine to medium quartz sand with fine white specks, possibly caliche, well sorted. 70-80cm.

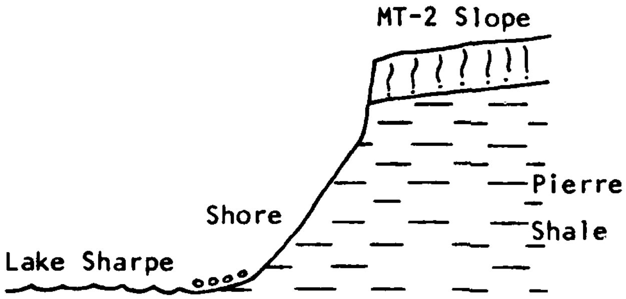
Buff to tan, medium sand, quartzose with ferruginous lithic fragments of Pierre Shale origin. Rootlets and animal burrows less prominent. Pebbles and cobbles prominent but sparse, otherwise well sorted.

Vertical scale: 1cm = 5cm

Figure K-14. Stratigraphic section at 39BF238.



A) Cut of MT-2 along Lake Sharpe below 39BF238. Pierre Shale exposed in bank from top of sloping terrace edge to lake level. No silt cap present.



B) Cut of MT-2 along Lake Sharpe below 39BF238. Pierre Shale exposed in bank from Lake Sharpe shore level and capped by a few inches to a few feet of fine sand and silt. No humic horizons present in silt which was deposited on a sloping surface cut by Missouri River below MT-0 level and subsequently partly covered by windblown silt and colluvial sand. Note lack of MT-2 gravel.

(Not drawn to scale.)

Figure K-15. Comparisons of the lake bank cuts below 39BF238.

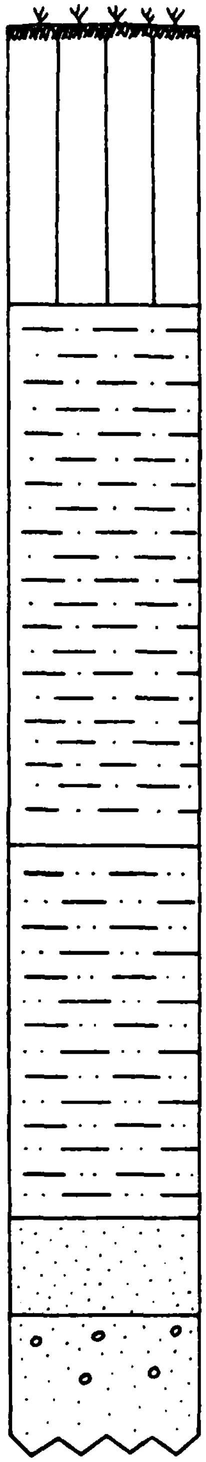
over a considerable period of time. There are good possibilities for mixing of artifacts found in levels below 70cm. The silt above 70m appears to be related to the supply of windblown silt off the Missouri River bottom and exposed island surfaces along the Missouri River.

Lacking a specific horizon to date for archeological purposes, and in addition lacking soil stabilization horizons and records of other events, it is difficult to place the section into a stratigraphic framework. The section shown in Figure K-14 is consistent with the interpretation that the lower unit is equivalent to the middle Holocene Pick City member of the Oahe Formation and that the upper unit represents some portions of the Riverdale Member (see Figure K-6 above).

The effect of slope on deposition and erosion is well displayed at this site by comparing described bank profiles (Figure K-15) with the test (Figure K-14) and a section redrawn from field notes by William Irving at the Medicine Crow site located a few tens of meters from 39BF238 (Figure K-16).

At the location of the bank slope (Figure K-15A) one sees a section comparable with that of the "Mosasour site" (see Coogan 1980) in the extreme portion of the hiatal holosome. Only the Pierre Shale is exposed. At the shoreline bank (Figure K-15B) there is a record of only the silt cap, presumably all of late Holocene age but with paleosols present on this sloping surface. At 39BF238, one sees two major units, possibly the middle Holocene sandy unit called Pick City and the upper unit of late Holocene silt (called the Riverdale Member). Either the late Pleistocene glaciofluvial gravels and sands have been eroded away or the profile was not dug deep enough to reach this level. Finally, at Medicine Crow (39BF2) a section shows parts of all three units but still without clearly defined soil stabilization horizons typical of a site within the major portion of the depositional holosome (Figure K-16). In other words, the position of these locations near the edge of the slope of MT-2, and in a favorable

(Vertical scale: 1 ft. = 10 in.)



MT-2 surface with modern soil.

A — Aeolian silt cap, late Holocene. Possibly a paleosol at 8-11 inches.

B — Aeolian silt and sand, more sandy toward the base. Interpreted as late to middle Holocene. Lack of recorded paleosols and recorded erosional surfaces makes subdivision difficult.

C — More sandy portion of section. Interpreted above.

D — Silty sand unit. May be lower part of a middle Holocene aeolian depositional sequence or related to an early Holocene fluvial or Pleistocene fluvial regime.

E — Clean red sand with some pebbles and clay in small masses. Pleistocene glaciofluvial deposit. Surface between units D and E is an unconformable surface.

Figure K-16. Reconstituted section at Medicine Crow (39BF2) from Irving's notes (S.I.R.B.S. Site Records).

wind position, resulted in a combination of erosion on the slope, minor deposition on the slope intermixed with further episodes of erosion and little in the way of soil stabilization.

In such a position, natural stratigraphy of the sites offers little in the way of clues to dating because the stabilization zones are absent and the stream eroded gullies (compare the Rousseau site) either are absent or not observed in present and earlier work.

THE DIAMOND-J SITE

(39HU89)

The Diamond-J site lies in a small valley cut by an intermittent creek on the left bank of the Missouri River (Lake Sharpe), Hughes County, South Dakota. The uplands on both sides of the valley form a moderately level surface which is mapped as the MT-3 terrace (ca. 1,500 ft. level) in the Big Bend area and is shown on the USGS 7.5-minute topographic map (Lower Brule, NW Quadrangle). The valley in which the Diamond-J ranch and the site are located was formed by the downcutting of the creek from the MT-3 level in response to the lowering of base level of the nearby Missouri River. The present valley floor, much of it a gently sloping surface, is the fill formed in response to the deposition of the MT-2 river terrace (Figure K-17). Thus, the main floor of the valley, graded to the MT-2 level, is designated as the creek terrace CMT-2. A geological map of the site area was made on the survey map of the site (Figure K-18). Springs appear to be related to the intersection of the terrace edge, probably where the bedrock Pierre Shale is shallow beneath the terrace fill and colluvial slope wash from the MT-3 terrace level.

The small flats within the valley floor adjacent to the stream represent grading of the stream to the MT-1 terrace level and were designated on the geological map as CMT-1. The present level of the stream, away from Lake Sharpe, is graded to the original (i.e., pre-dam) level of the Missouri River.

A generalized sequence of events in the valley is shown in Figure K-19 as a series of three diagrams. The diagrams show the progressive cutting and filling of the Diamond-J valley by the stream and filling of the valley with stream overbank, stream channel and slope wash deposits.

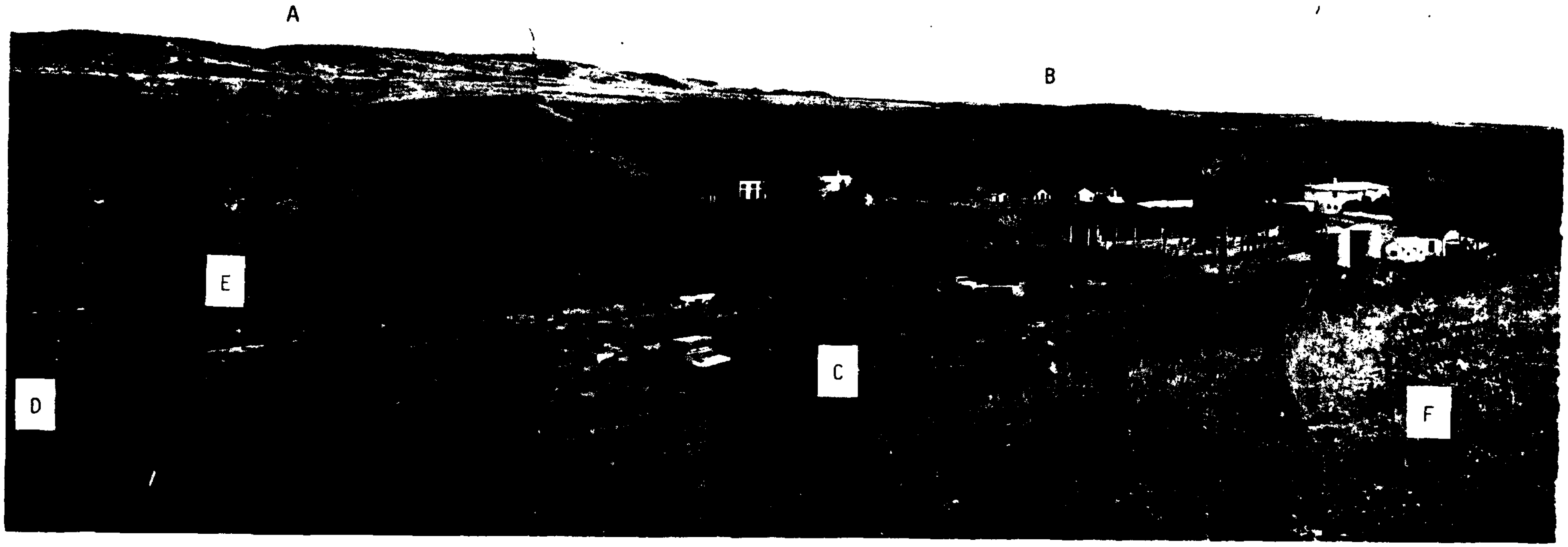


Figure K-17. Composite photograph of the Diamond-J valley looking north. In the background (A) is the MT-4 terrace. The flat in the high middle ground (B) is MT-3. The lower flat in the *middle ground* (C) is the creek terrace fill of CMT-2 and the location of a number of test pits including Test 1 (D). CMT-1 can be faintly seen between a break in the trees (E). The foreground to the right of the photograph is the lower portion of the MT-3 terrace slope where gravelly sandy slope wash covers the surface (F).

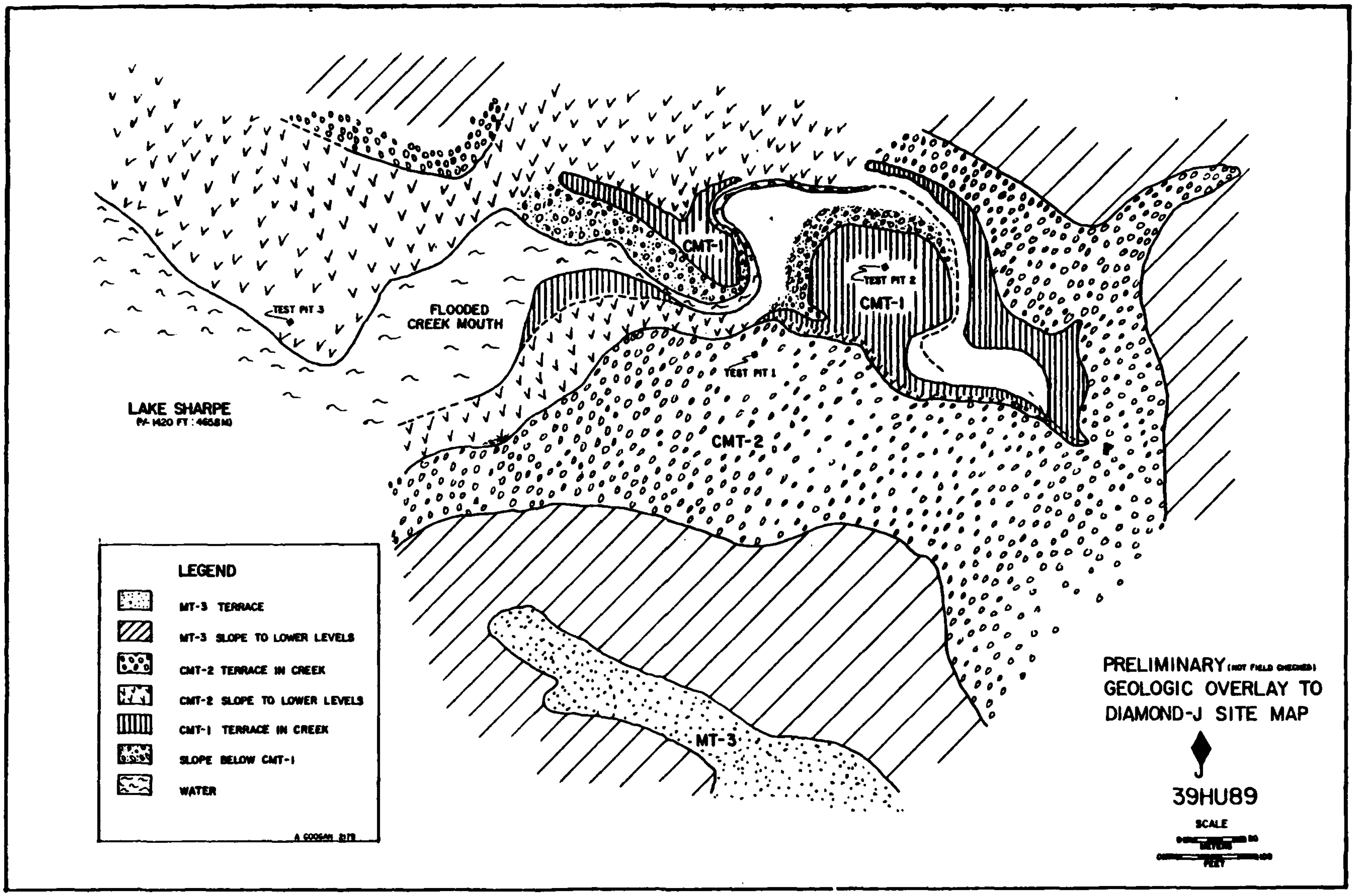


Figure K-18. Geological map of Diamond-J site.

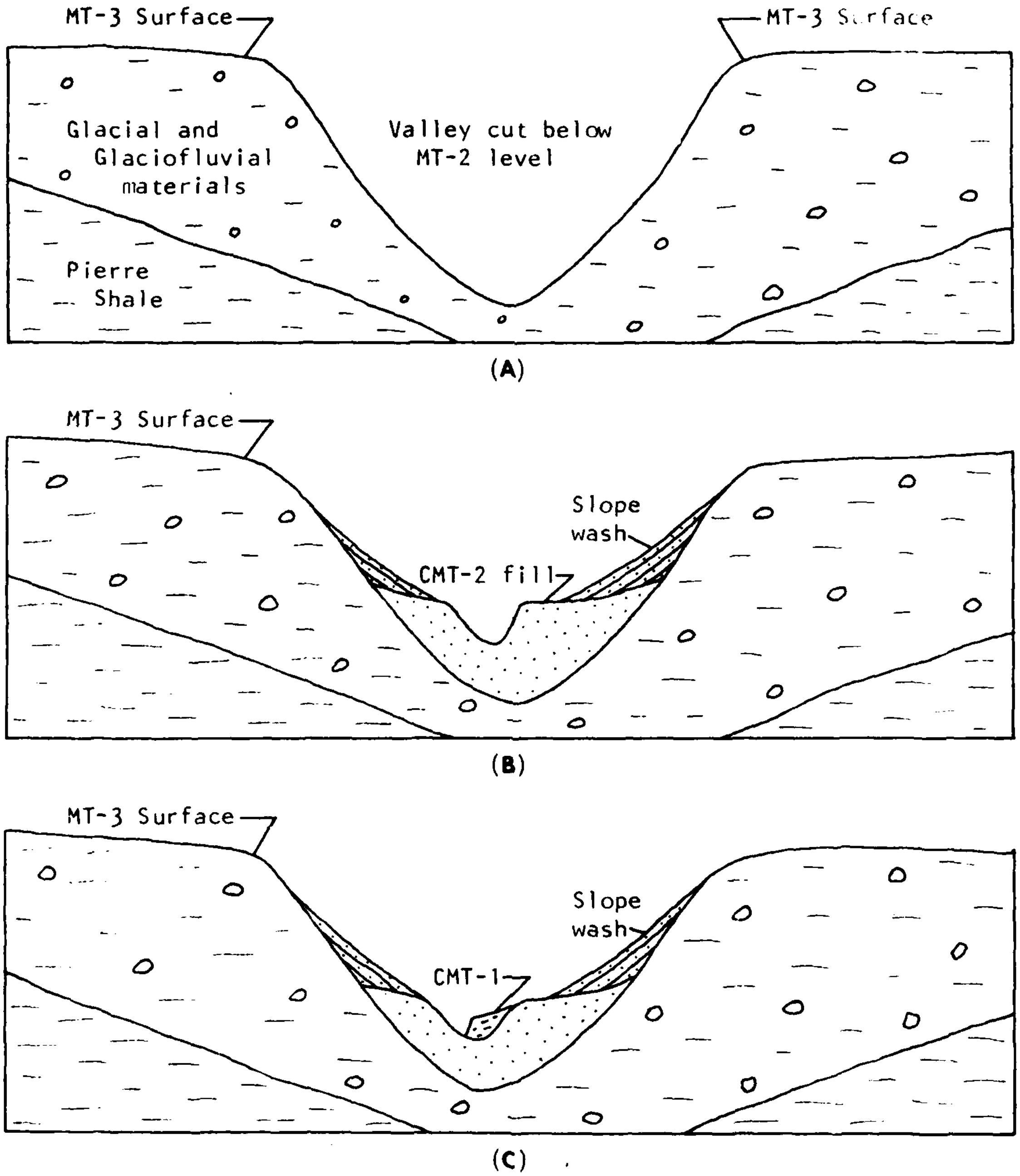


Figure K-19. Diagrammatic cross sections of the Diamond-J valley showing the development of the valley between the "walls" of the MT-3 terrace in late Pleistocene and Holocene time. A) Downcutting of the valley through MT-3 to a level below that of present level of MT-2. Position of the Pierre Shale is diagrammatic because it is not exposed in the valley, it may be higher than shown, i.e., closer to the surface. B) Deposition of the fill of CMT-2 in response to a rise in base level of the adjacent Missouri River and deposition of slope wash or part of the CMT-2 surface of the valley walls. Incision of the CMT-2 fill by the creek. C) Deposition of the fill of CMT-1, some slope wash from higher levels and incision of the CMT-1 surface to lower base levels.

SETTING AND CORRELATION OF TEST PITS

Several tests were excavated in 1978 and 1979, some of which were open during the geological work in the Lake Sharpe area; others were opened after the geological field season. Based on observations in the tests, bank profiles and inspection of the profiles of the other tests, a number of observations regarding the natural stratigraphy of the site can be made.

Most of the tests were excavated into CMT-2, on the lower slopes of CMT-2, on the lower slopes of CMT-3, or in the case of Test 2, in CMT-1. The location of the tests with regard to these terrace surfaces can be ascertained from the geological map and survey map of the site. Test 1 and its extensions in Tests 4, 5, and 6 were the deepest and are located immediately above a bank profile along the stream. The stratigraphy in Test 1 is shown in Figures K-20 and K-21, and detailed in Tables K-2 and K-3. The bank profile is shown in Figure K-22.

Correlation of the gross units and the individual units of a selection of the tests was attempted taking into consideration the elevation of the surface at the test, the depth of the test, the units encountered and the position of the test with regard to the terraces of the creek. Two general cross sections (Figures K-23, K-24) and two detailed cross sections (Figures K-25, K-26) show the relationships between the tests. Figures K-24 and K-25 show tests 7, 8, and 10 on the CMT-2 terrace or its slope toward the stream. Figures K-23 and K-26 show tests 10, 1, 2, and 11. Tests 10 and 1 lie on CMT-2 and are correlatable. Test 2 is excavated into CMT-1 and cannot be correlated with the others. Test 11 is on the slope of MT-3 and cannot be correlated well with the others. The detailed sections (Figures K-25, K-26) show that Tests 10 and 11 were probably excavated sufficiently deep to have encountered the cultural layer present in Test 1 (4, 5, 6). The same is true for Test 8. Test 7 probably lies sufficiently low on the terrace of CMT-2 that this cultural layer, tentatively associated with the middle or early Plains Archaic period, is not preserved.

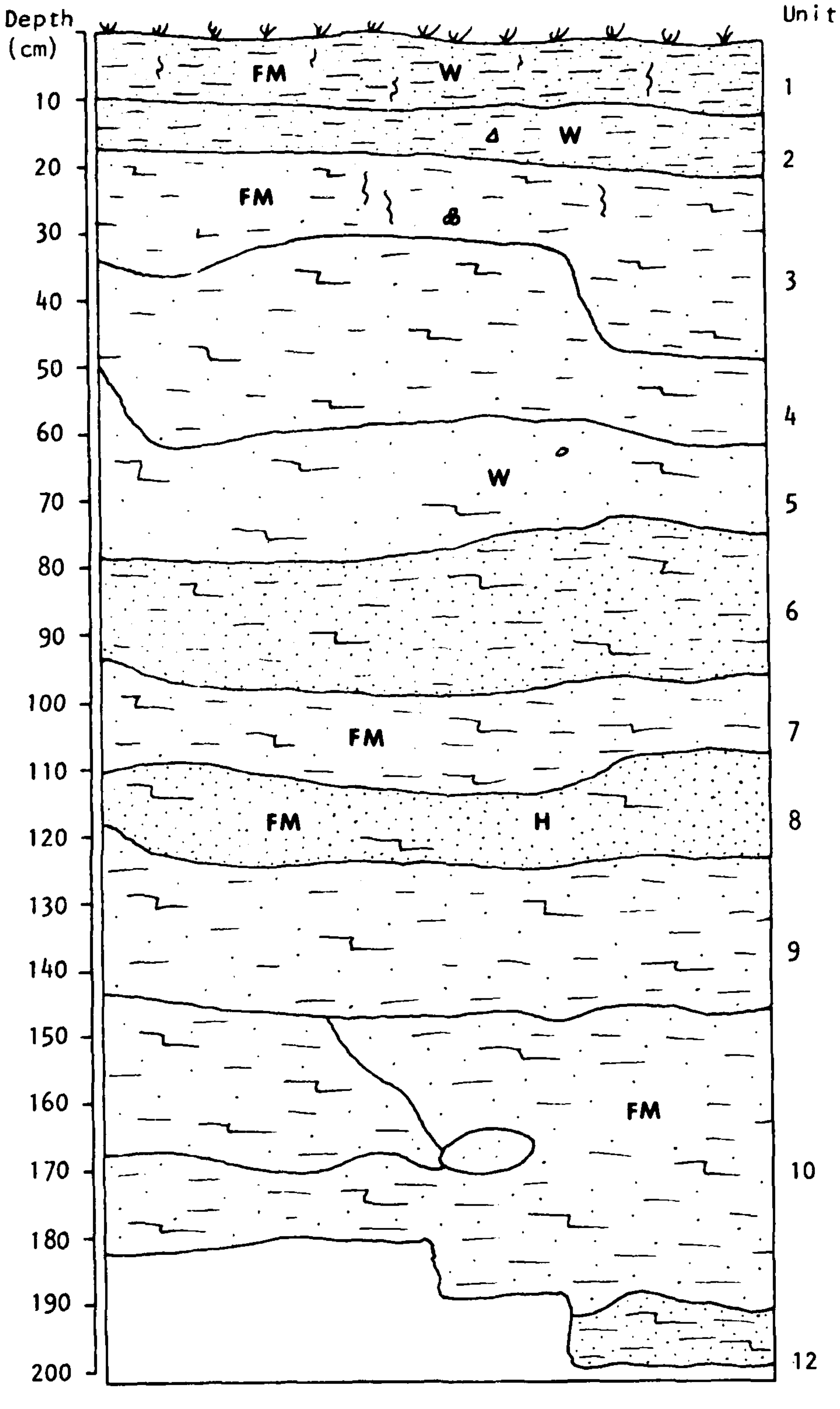


Figure K-20. Diagrammatic presentation of the natural stratigraphy of Tests 1, 4, 5, and 6 based on field descriptions and sample descriptions as detailed in Tables K-2 and K-3. The upper cultural level is in Units 1-2, the lower cultural level is in Units 7-8.

Figure K-21. Photograph of Test 1.

Table K-2. Summary and interpretation of natural stratigraphy at site 39HU89, Test 1 (west wall description).

Unit	Sorting	Color	Calcareous content	Median grain size	Ferro-magnesian mineral content	Minor rock fragments and other	Inter-pretative natural history	Cultural horizons
1	Well sorted	Dark brown	Leached	Silt	Dark mica and others	Roots	Soil zone, leached of calcareous material, prob. mixed eolian and colluvial origin of parent material	Upper cultural zone
2	Well sorted	Dark brown	Present	Silt	--	Chert and roots		
3	Poorly sorted	Brown	Present	Silt and medium sand	Ferromag. minerals fresh	Roots and animal fecal pellets	Lower soil zone accumulation, calcareous, prob. wind and colluvial origin of parent material Iron minerals prob. from Pierre Shale on valley sides.	
4	Poorly sorted	Brown	Present	Silt and medium sand	Less ferromag. minerals	Black angular chert		
5	Well sorted	Light brown	Present	Very coarse sand	--	Pebble, rock frags.	Colluvial slope wash deposit	Sparse

[a]Clumps = sand is found in coarse grained clumps held together with silty or clayey material.

Table K-2. Summary and interpretation of natural stratigraphy at site 39HU89, Test 1 (west wall description) (concluded).

Unit	Sorting	Color	Calcareous content	Median grain size	Ferro-magnesian mineral content	Minor rock fragments and other	Inter-pretative natural history	Cultural horizons
6	Poorly sorted	Dark brown	Present	Medium sand and clumps[a]	--	--	One or two zones of accumulation, prob. former soil zones of mixed colluvial and wind origin for parent materal	Sparse
7	Poorly sorted	Brown	Present	Medium-coarse sand	Limonitic	Rock frags.		Second cultural zone
8	Poorly sorted	Dark brown	Present	Medium-coarse sand	Hematitic and fresh ferromag.	Chert		
9	Poorly sorted	Grey brown	Present	Medium-coarse sand, clumps	Hematitic and limon-itic	Rock frags.	Probable water deposited and mixed colluvial sediment	
10	Poorly sorted	Grey brown	Present	Medium-coarse sand, clumps	Limonitic	Black rock frags.		
12	Medium well sorted	Grey	Present	Medium-fine sand	Fresh mica	--	Stream deposit	

[a]Clumps = sand is found in coarse grained clumps held together with silty or clayey material.

Table K-3. Binocular microscope description of natural stratigraphy for Tests 1, 4, 5 and 6, site 39HU89.

Level	Description
1	Light brown to dark brown, silt with rounded medium size quartz grains less than 5%. Less than 1% mica and other ferromagnesium minerals. Non-calcareous, roots. Well sorted.
2	Light to dark brown, silt with up to 15% quartz moderately rounded grains. Chert fragments less that 1%. Non-calcareous, roots. Well sorted.
3	Brown silty quartz sand, medium to coarse grained, less than 30% quartz. Poorly sorted, calcareous. Minor ferromagnesium minerals, fecal pellet clumps and roots.
4	Light brown, mixed silt and quartz sand, quartz to 35% in clumps. Minor ferromagnesium minerals. One blocky, angular chert flake. Calcareous. Well sorted.
5	Tan, moderately well sorted, very coarse quartz sand more than 90%. Less than 2% rock fragments in sand to pebble size. One rose-red quartz fragment. Rounding medium to well. Calcareous. Sand loose, not compacted or clumpy. Poorly sorted.
6	Dark brown, clumpy, clayey, silty quartz sand. Sand less than 35%. Calcareous, poorly sorted.
7	Brown, clumpy, ferruginous, calcareous silty quartz sand. Minor rock fragments. Sand medium to coarse grained, poorly sorted.
8	Dark reddish brown, ferruginous, hematitic quartz sand. Minor chert fragments, shaly rock fragments and ferromagnesian minerals. Sand medium to coarse grained, calcareous, poorly sorted.
9	Grey-brown clumpy ferruginous, calcareous silty quartz sand. Sand medium to coarse, medium sorted. Occasional pebbles and rock fragments.
10	Grey-brown, ferruginous, calcareous, silty quartz sand. Sand medium to coarse with minor rock fragments. Poorly sorted, clumpy.
11	Grey-brown, ferruginous, calcareous, moderately well sorted, medium quartz sand.
12	Grey-brown, calcareous, medium to fine-grained silty quartz sand. Fresh mica flake.

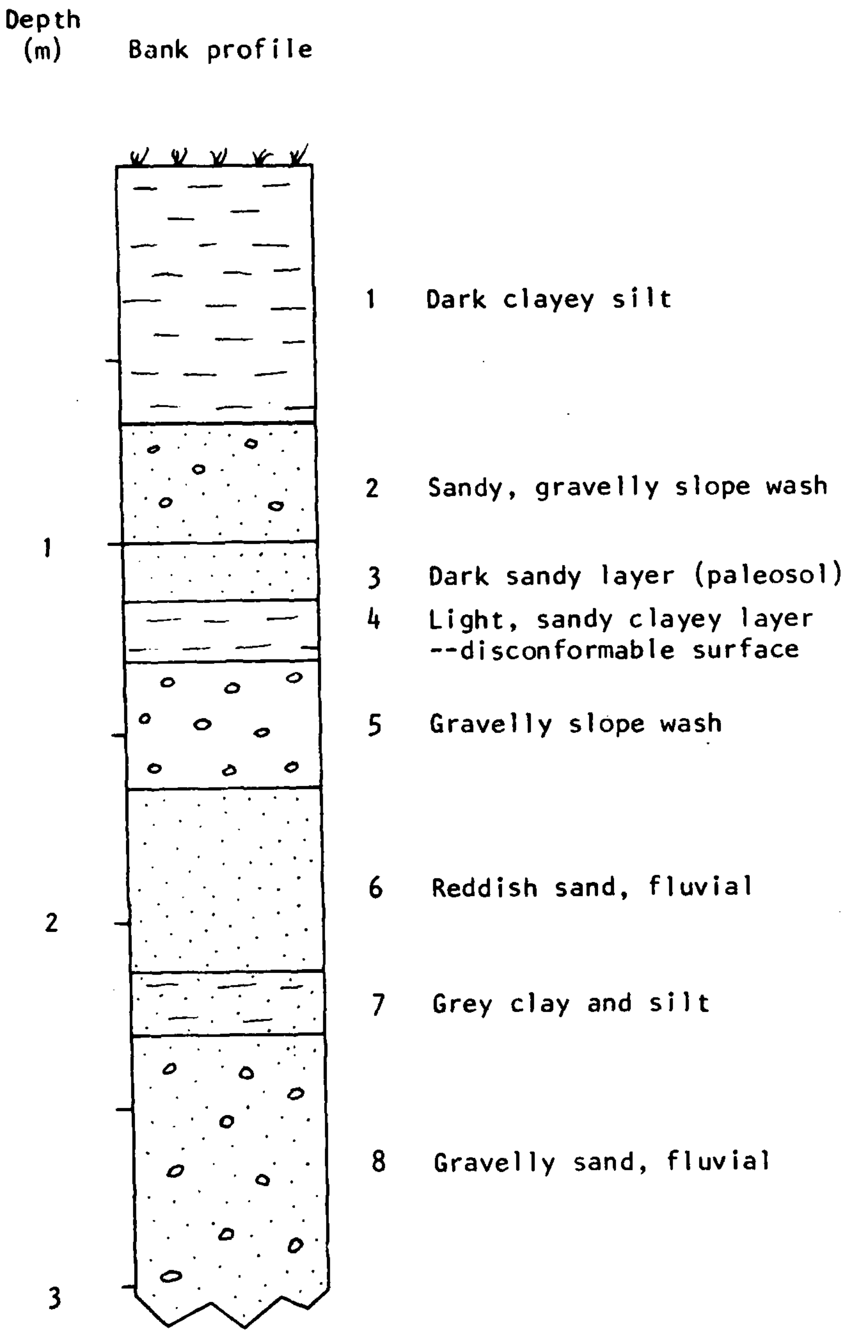


Figure K-22. Diagrammatic profile of the bank of the creek immediately below the site of Test 1. Unit 4 of the bank profile is approximately equivalent to Units 7-8 of Test 1. Unit 6 of the bank profile is equivalent to Unit 12 of Test 1.

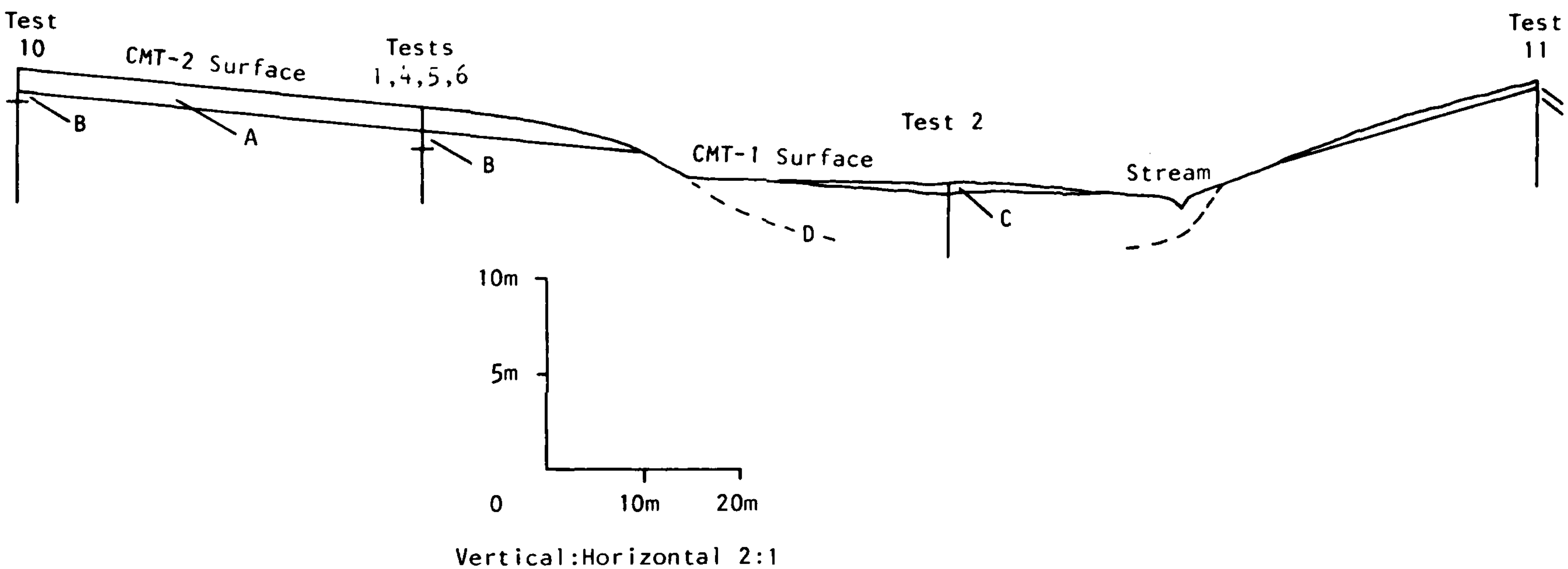


Figure K-23. Correlation cross section of Tests 10, 1, 2 and 11. The surface is the modern surface; terrace levels of the creek are shown. Unit A, found in Tests 10 and 1, is the Holocene deposit. Unit B is the sand or gravel of the Pleistocene fluvial or colluvial units. Unit C is the Holocene deposit of Test 2 on CMT-1. It is not directly correlatable with Unit A. Unit E is a slope wash deposit in Test 11 on the far side of the creek from the other tests.

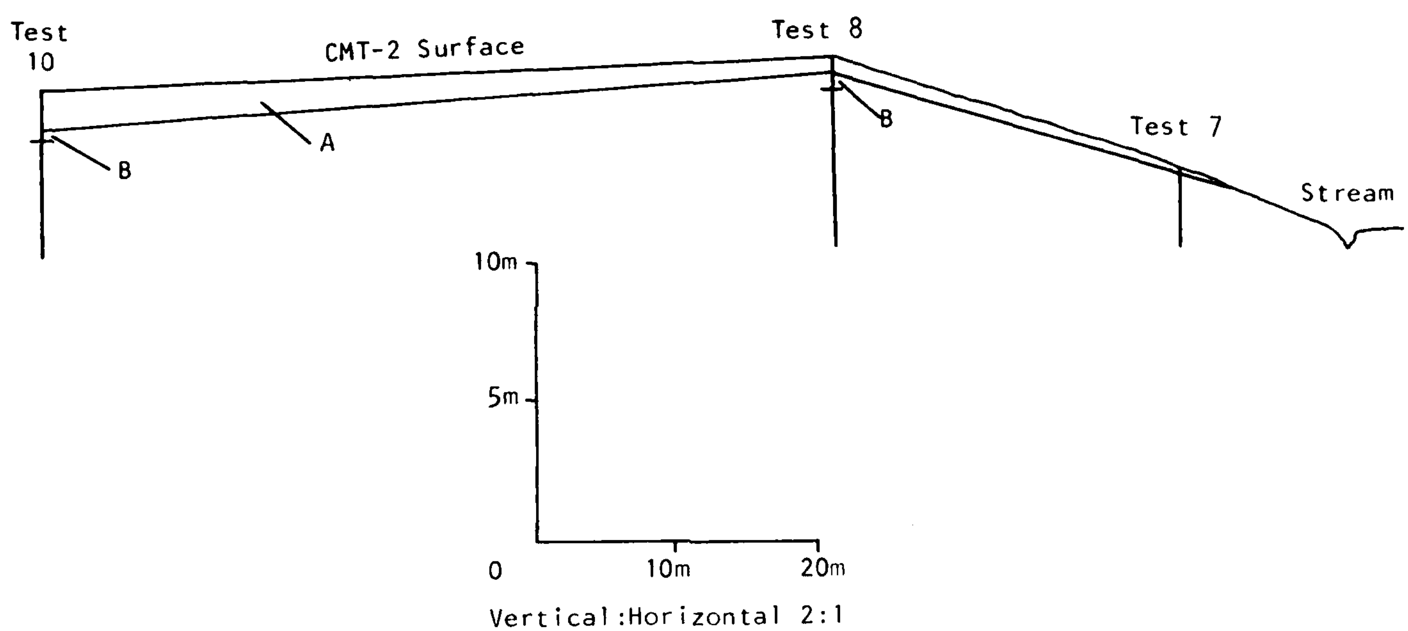


Figure K-24. Correlation cross section of Tests 10, 8 and 7. Units are the same as in Figure K-23.

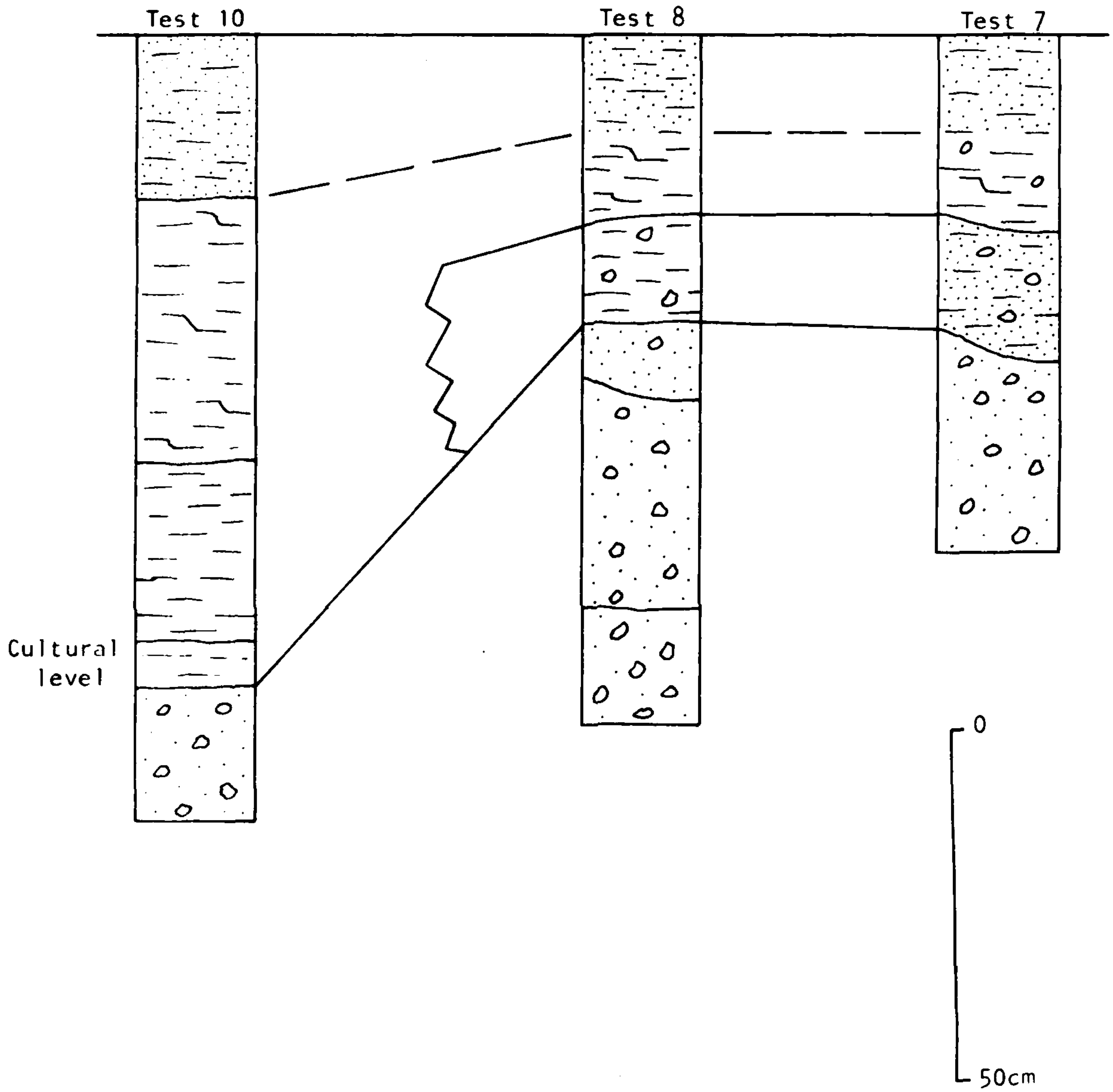


Figure K-25. Detailed correlation cross section of Test 10, 8 and 7, using the present ground surface as datum. As shown, the cultural level in Test 10 is correlated with the weak paleosol in Test 7 and the modern soil layer is matched between all the test pits.

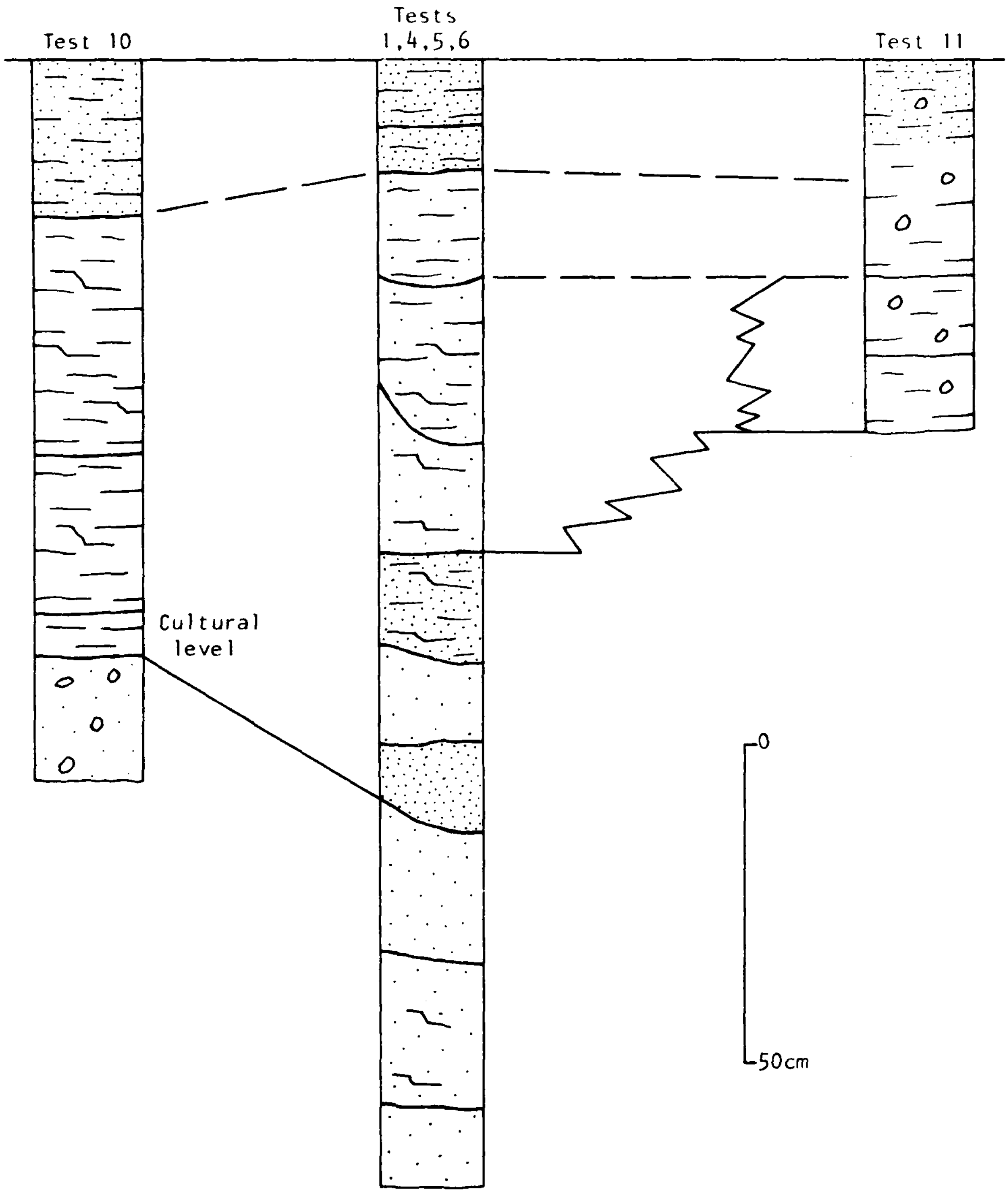


Figure K-26. Detailed correlation cross section of Tests 10, 1 and 11 using the present ground surface as the datum without regard to elevation. Test 2 is not shown because it cannot be correlated across the section. A change in lithology between Test 11 and 1 is shown indicating the change from mainly slope wash in Test 11 to mixed materials in Test 1. The level of the cultural layer in Test 1 (Unit 7 of Figure K-20) is shown as correlated to the cultural level in Test 10.

THE ROUSSEAU SITE
(39HU102)

LOCATION AND PREVIOUS WORK

The Rousseau site is located at the edge of the present bank of Lake Sharpe, Hughes County, South Dakota (Figure K-30). The bank profiles are cut into the upper slopes of MT-2. The higher lying knolls uphill from the site are at the MT-3 level. A map of the site area with terrace levels was included in preliminary reports as an overlay to the site plan. Previous work at the site includes a preliminary examination of samples collected from the bank in February, 1979 and a field investigation made during the summer of 1979 after partial excavation of the site. The significant results of these investigations are reported here.

GEOLOGICAL SETTING OF THE SITE

A description of the general geologic setting of the site is given in a summary geological report for the Big Bend Reservoir area and includes a summary of the sequence of geologic events at the Rousseau site to accompany a generalized cross section of the site along the bank (Figure K-31). That summary is repeated here in Table K-6. The Rousseau summary profile and cross section are based on a more detailed cross section (Figure K-32) constructed from seven short profiles along the bank edge. The more detailed interpretation of the events evident in Figure K-32 is given in tabular form in Table K-7.

In general, the Rousseau site shows a record of Holocene depositional and erosional events about midway between a fully developed depositional sequence (see Figure K-6) such as one sees at Crow Creek and a fully developed erosional sequence (or non-sequence) such as one sees where bare Pierre Shale crops out along Lake Sharpe. In terms of the depositional and erosional holosome model (Figure K-6), the Rousseau site lies at about the 50% line--i.e., it displays erosional and depositional events about equally.

Table K-4. Summary and interpretation of natural stratigraphy at site 39HU89, Test 2 (north wall description).

Unit	Sorting	Color	Calcareous content	Median grain size	Ferro-magnesian mineral content	Minor rock fragments and other	Inter-pretative natural history	Cultural horizons
1	Well sorted	Dark brown	Leached	Silt	Minor mica	Pebbles of Pierre Shale	Upper leached soil horizon Parent material prob. alluvial and colluvial	Top few centi-meters
2	Poorly sorted	Medium brown	Present	Silt, clumps[a]	Minor ferru-ginous, limonitic	Pierre Shale fragments	Lower portion of soil and parent material, prob. alluvial	
3	Medium well/ poorly sorted	Medium brown	Present	Fine to medium sand	Hematitic	Pierre Shale fragments	Stream, prob. overbank and colluvial	

[a]Clumps = sand is found in coarse grained clumps held together with silty or clayey material.

Table K-5. Binocular microscope description of natural stratigraphy for Test 2, site 39HU89.

Level	Description
1	Dark brown, silt. Minor quartz, median grain to 15%. Minor mica less than 1%, rock fragments of Pierre Shale. Sorting good except for pebbles. Leached, non-calcareous. Clumpy texture where silt stuck together.
2	Medium brown, sandy quartose silt. Sand medium grained, to 30%. Minor rock fragments of Pierre Shale. Minor mica and roots. Pierre Shale ferruginous, limonitic. Sorting good to poor. Clumpy texture, calcareous.
3	Medium brown, fine-medium quartz sand, silty. Rock fragments of Pierre Shale. Sorting medium to poor, calcareous, minor roots present and hematitic.

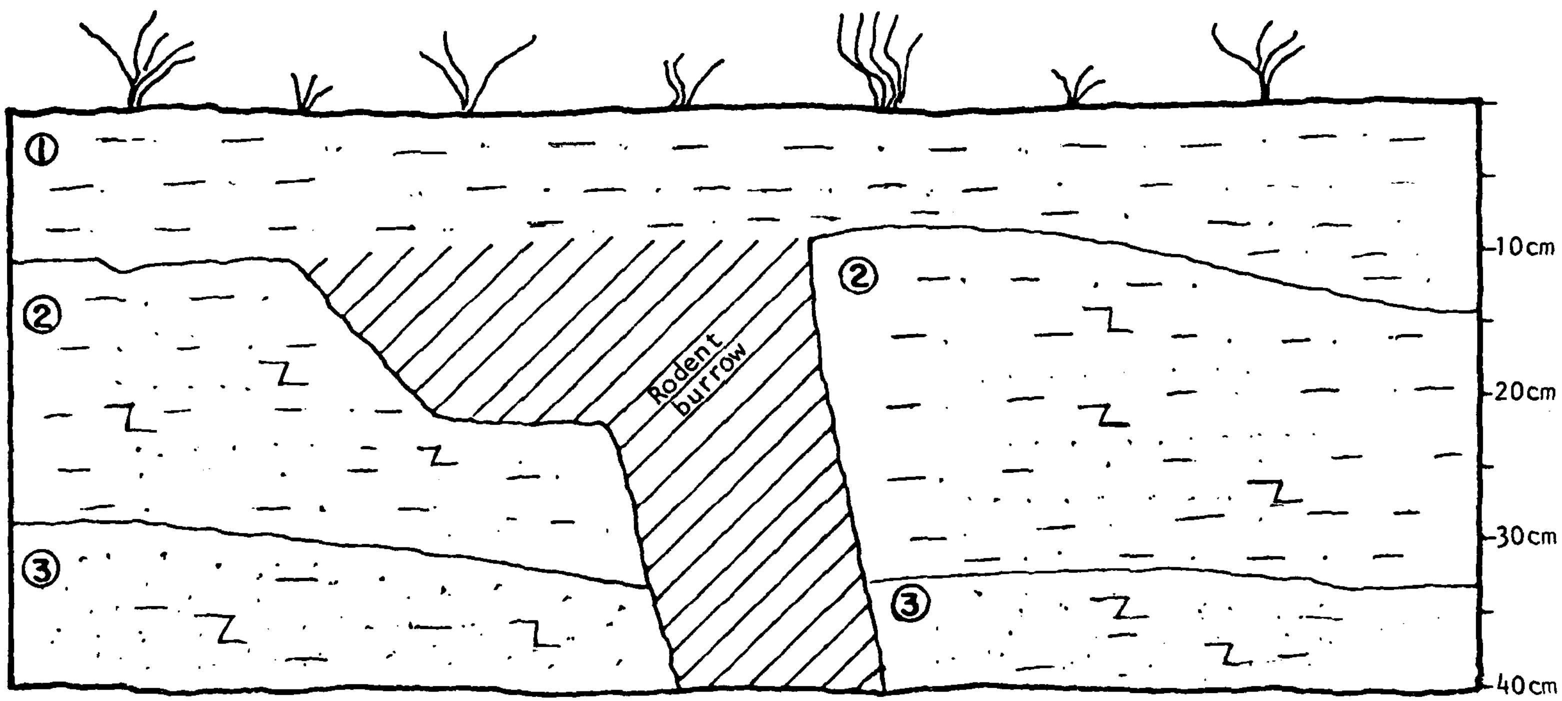


Figure K-27. Diagrammatic section of Test 2 on CMT-1 as described in Tables K-4 and K-5.

Figure K-28. Photograph of Test 2, site 39HU102.

Figure K-29. Photograph of the bank cut in a ravine on the northwest side of the creek across from Test 1. The surface is the lower slope of MT-3 and upper surface of CMT-2. Modern gully formation has excavated part of the sediment along this gully exposing the slope wash sediment. Note that fine silt and sand is interbedded with gravelly stringers. None of the units have a substantial lateral extent, but can be seen to be continuous for several meters. The individual beds have a slope toward the creek at or slightly steeper than the present slope of the surface. The exposed bank profile here is comparable to portions of the section excavated in the test pits, assists in explaining the presence of gravelly layers at various levels in the tests and points out the strong sedimentary differences between the Holocene sediments in creeks and those found in the principally aeolian deposited section on terraces adjacent to the Missouri River proper.

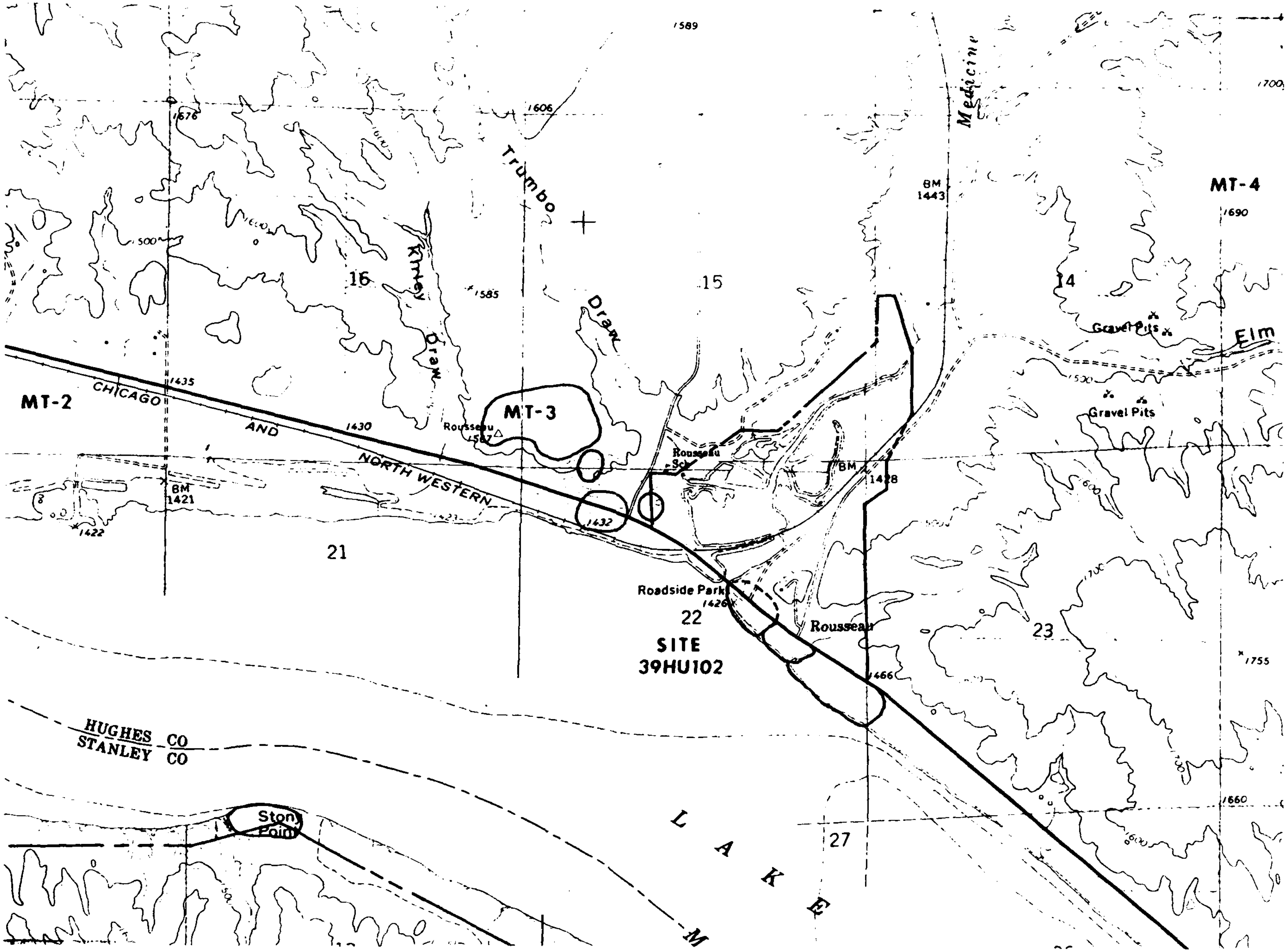


Figure K-30. Portion of U.S.G.S. Rousseau Quadrangle (7.5-minute topographic) showing location of Rousseau site.

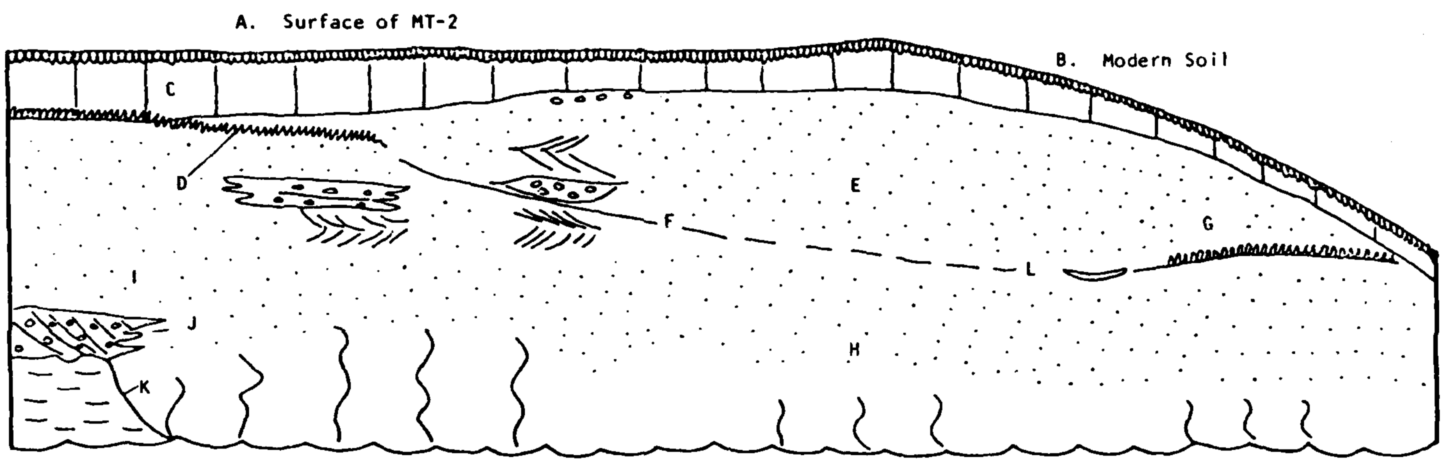


Figure K-31. Generalized cross section of the bank profile at the Rousseau site constructed from seven short profiles along the bank and two test pits. See Table K-6 for description of events.

Table K-6. Summary of geologic events represented at the Rousseau site (39HU102) as illustrated in Figure K-31.

1. Erosion of the Pierre Shale into valleys and hills. A remnant of the Pierre Shale crops out above water level (Unit K).

2. Deposition of cross bedded glacifluvial gravels on the eroded Pierre Shale bedrock surface during the Pleistocene (Unit J).

3. Erosion of the Pleistocene gravels forming gullies which cut both the gravels and portions of the underlying Pierre Shale.

4. Deposition of aeolian sands (Units I, H) with interbedded gravelly slope wash in the eroded gullies. Probably middle Holocene (= Pick City).

5. Erosion of gullies into the aeolian sands (Unit F surface).

6. Formation of a paleosol (Units D, G) on this eroded surface. Hearth at L (dated ca. 3300-3900 B.P.) created on this surface (F) at or about the time of the paleosol formation at D and G.

7. Filling of the gully by aeolian sands and slope wash (Unit E).

8. Deposition of aeolian silt (Unit C) over the paleosol (Unit D) and the gully fill (Unit E).

9. Deposition of late Holocene and Modern soils with late gully formation contemporaneous with part of these events.

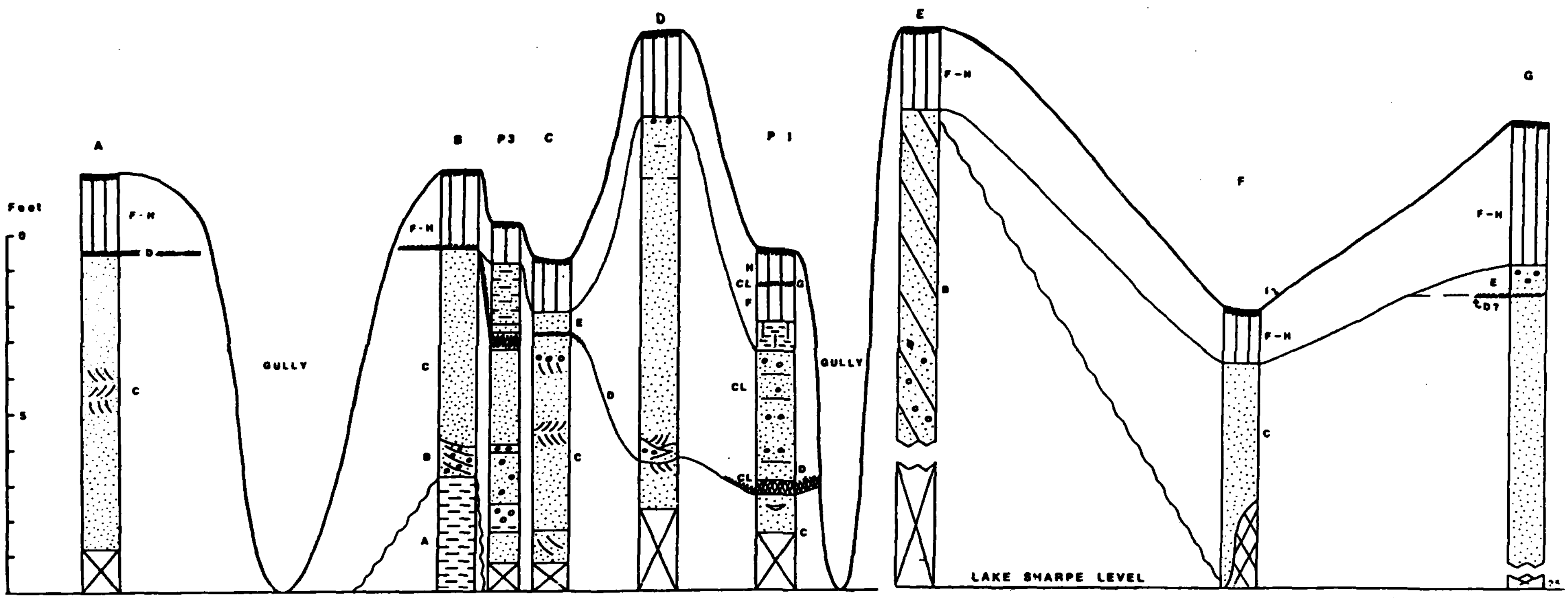


Figure K-32. Detailed cross section of profiles along the bank at Rousseau. See Table K-7 for legend, and discussion and description of events.

Table K-7. Geological events based on cross section and profile information presented in Figure K-32.

Interpretation of Events
1. Erosion of valley into the Pierre Shale sometime during the Pleistocene and deposition of glaciofluvial gravels (Unit B) on this eroded surface.
2. Erosion of the glacifluvial gravels by valley forming processes during or at the end of the Pleistocene.
3. Deposition of aeolian sands (Unit C) in the cut made into the underlying units. Some admixture of slope wash pebbly materials. The aeolian sands are crossbedded in part of the section and at the profile F cover over a glacial erratic which is a remanent of the glaciofluvial deposits or which moved downhill from the erratic covered upper surface. Erosion of these sands is post-4000 B.P. indicating that they are reasonably correlated with the Pick City Member of the Oahe Formation.
4. Erosion of sands of Unit C by small scale gullies (4-5 feet deep) and formation of a paleosol (Unit D) on the upper surface away from the gully proper. Hearths lying on this surface in the gully are dated at between 3300 and 3900 B.P. by radiocarbon means on charcoal from the hearths. The erosion is late Holocene and the paleosol (Unit D) appears to be equivalent to the lowest paleosol of the Riverdale Member of the Oahe Formation.
5. Deposition of sandy aeolian materials or silty materials over the paleosol filling the gully (Unit E). Some admixture of slope wash pebbly strata.
6. Continuation of aeolian deposition, predominantly silty and the formation of the silt cap (Units F-H).
7. Development of a soil stabilization horizon or paleosol (Unit G) locally. This contains cultural materials at P-4. Plains Tradition materials are found at this level.

Note: Described sections are lettered A-G; P3 and P4 are tests or profiles along the bank (see Figure K-32). Letters for stratigraphic units are as follows: A = Pierre Shale; B = glaciofluvial sands and gravels; C = aeolian sands with gravelly layers, mainly colluvial and crossbedded sands; D = erosional surface on top of parts of Unit C or equivalent paleosol (Sections A, G); E = aeolian sands lying above surface D and filling the gully; F = aeolian silt overlying Unit E; G = paleosol in aeolian silt; H = aeolian silt overlying paleosol Unit G; F-H = undivided aeolian silt overlying Unit E; CL = cultural level.

Table K-7. Geological events based on cross section and profile information presented in Figure K-32 (concluded).

Interpretation of Events
8. Gully cutting, essentially modern erosion took place certainly between the deposition of Units E and H. It is not clear whether G is cut out by the gully or combines with the modern slope. The gullying could be during the time of formation of Unit G, a few hundred years ago. The G Unit paleosol may correspond to the uppermost of the Riverdale paleosols, at or younger than 1000 B.P.
9. Continued aeolian silt deposition (Units H and F-H undifferentiated) with Modern soil formation on the upper surface of H, or F-H.

Note: Described sections are lettered A-G; P3 and P4 are tests or profiles along the bank (see Figure K-32). Letters for stratigraphic units are as follows: A = Pierre Shale; B = glaciofluvial sands and gravels; C = aeolian sands with gravelly layers, mainly colluvial and crossbedded sands; D - erosional surface on top of parts of Unit C or equivalent paleosol (Sections A, G); E = aeolian sands lying above surface D and filling the gully; F = aeolian silt overlying Unit E; G = paleosol in aeolian silt; H = aeolian silt overlying paleosol Unit G; F-H = undivided aeolian silt overlying Unit E; CL - cultural level.

Test 2 (Figures K-27, K-28; Tables K-4, K-5) was excavated into CMT-1 through a sequence of deposits which are more related to the stream deposition than the materials of the sections which lie higher. The materials in the higher sections are substantially influenced by aeolian deposition and colluvial (slope wash) processes.

Deposition of deposits excavated in all of the tests on the whole was probably slower and more continuous than on the exposed terraces of the Missouri River proper. The general setting of the site in the Diamond-J valley, sheltered from the winds on the upland terraces, fed by springs and in a position to receive considerable contribution of slope wash from the adjacent hills, has probably not changed substantially since the early Holocene. All the deposits lying above the reddish sand and gravel (e.g., in the bank profile, Figure K-22) are interpreted as Holocene deposits. The coarseness of the sediments is not indicative of early age. Very coarse sediment intermixed with fine sediment can be seen as part of the slope wash fill of the Diamond-J valley in a gully on the northwest side of the creek, across the creek from Test 1 (Figure K-29).

DESCRIPTION OF BANK PROFILE 4

Bank Profile 4 samples were described using a binocular microscope during the winter of 1978-1979. The description of the detailed units is given in Tables K-8 and K-9 and shown diagrammatically in Figure K-33 and Table K-10. The description as presented is essentially the same as presented in the preliminary report (Steinacher and Toom 1979:Appendix 3, Section D, pp. D-27 - D-33). The interpretive column of Figure K-33 has been changed somewhat, however, owing to the reinterpretation of the natural stratigraphy subsequent to fieldwork in the summer of 1979.

COMPARISON WITH OTHER SITES

The Rousseau site is one of the key sites in the Big Bend area for explanation of the sequence of geological events in the Holocene

Table K-8. Description of natural stratigraphy for Bank Profile 4 based on binocular microscope examinations.

Unit	Description
1	Dark brown quartz silt, less than 5% fine to medium sand. Slightly calcareous, good sorting, roots and less than 1% fresh mica present. Modern soil layer at top.
2	Dark brown quartz silt, less than 5% fine to medium sand, calcareous, sorting good. Also present are roots, very fine ferromagnesian minerals and a white chert pebble.
3	Light brown quartz silt, calcareous, good sorting with dark rock fragments in the sand size range.
4	Brown quartz silt and 10-15% fine to medium quartz sand. Calcareous, contains rock fragments to coarse grain size. Sorting medium, also present are very fine grained ferromagnesian minerals and fresh mica.
5	Very fine and fine quartz sand with coarse sand to pebble size rock fragments derived from the Pierre Shale. Light brown.
6	Brown very fine to very coarse grained quartz sand and pebbles. Sorting poor, calcareous. Rock fragments include grey shale fragments from the Pierre Shale, black ferruginous fragments, and hematitic shale fragments. Rock fragments constitute 30% of coarse sand to pebble size materials.
7	A. Light brown quartzose fine to coarse sand with rock fragments as in 6 above. B. Light brown, coarse to very coarse quartz sand and pebbles. Coarser material contains flat-shaped light grey Pierre Shale fragments. Shale is hematitic and micaceous. Other fragments are very dark grey to black or reddish brown. Sorting poor, calcareous.
8	Light brown, clayey, silty quartz sand with rock fragments. Calcareous, sorting poor. Texture is clumpy, probably from admixture of clay. Fine silt is quartzose.
9	Brown clayey, silty quartose sand with grey and black rock fragments. Calcareous, sorting poor. Less clumpy texture than Unit 8.
10	Light brown, clumpy textured, clayey, silty, quartz sand with rock fragments. Sand is about 50% quartz, 50% rock particles.

Table K-9. Notes on natural stratigraphic units in Bank Profile 4 (P4).

Unit	Color	Grain size	Sorting	Remarks
1	Dark brown/ brown	Silt to very fine sand (5%)	Well	Top soil-fine windblown with periodic gravel.
2	Grey/dark brown	Medium sand (20%) Silt-fine grained with gravel	Moderate	
3	Tan	Silt/very fine sand (5%)	Very well	Contains caliche. Soil more compact than 1 or 2. No gravel.
4	Light brown	Very fine sand (5%)	Very well	Contains caliche (20%), more than 3. Some gravel.
5	Light brown	Very fine sand (5%) Gravel (5%)	Very well	Contains caliche (30-40%) and shale (30%). Small shale fragments are banded.
6	Brown	Very fine sand	Very well	Some sand, less than 5.
7	Light brown/tan	Very coarse (bands 40%) Fine sand (lenses)	Very poor	Sand w/i matrix (40-50%). Clay matrix.
8	Light brown/tan	Coarse/medium sand (30%)	Very poor	Similar to 7. Contains thick layer of clay.
9	Brown	Medium sand (50%)	Moderate	Contains gravel, sand and shale layer. Contains some fine grained sand.
10	Light brown	Coarse sand (40%)	Well	Primarily fine grain sand with gravel. Matrix contains more soil than 7.

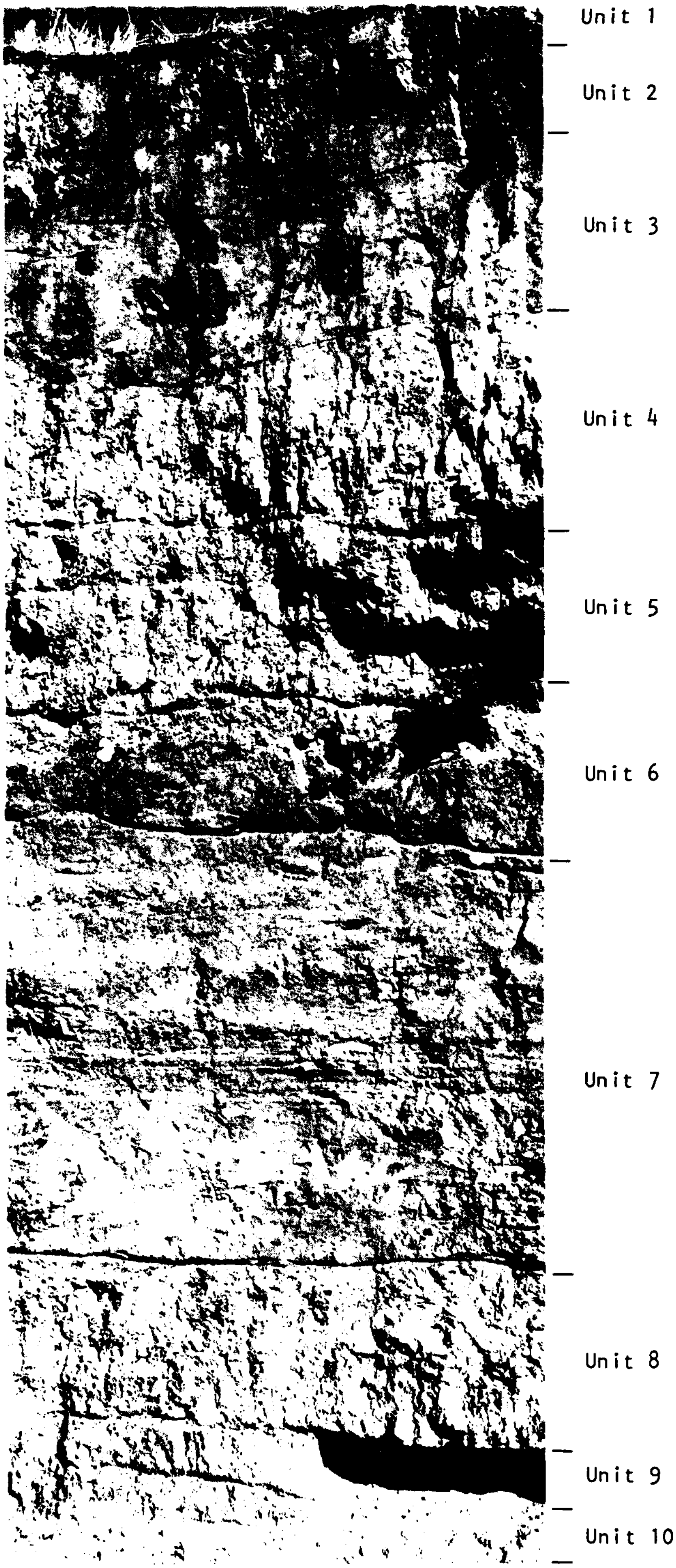


Figure K-33. Photograph of Profile P-4. Unit descriptions contained in Table K-10.

Table K-10. Tabular summary of stratigraphic section and interpretation of Profile 4 (Figure K-33).

Unit	Color	Sorting	Median grain size	Cal-careous content	Interpretation	Cultural horizons
1	Dark brown	Well	Silt	-	Aeolian silt deposit modified by soil form processes, esp. in Unit 1.	Historic·
2	Dark brown	Well	Silt	+	Second paleosol. Some admixture of slope materials.	Plains tradition
3	Brown	Medium	Silt	+		
4	Light brown	Poor	Silt, very fine sand	+	Mixed slope wash and aeolian silt	
5	Light brown	Well-poor	Fine-medium sand	+	Aeolian sand filling the eroded gully. Admixture of slope wash materials from eroding Pierre Shale bedrock upslope.	Bone and shell
6	Brown	Poor	Fine-medium sand	+		
7	Light brown	Poor	Coarse- very coarse sand, gravel	+	Aeolian crossbeds	
8	Light brown	Poor	Fine sand	+	Gully filling by sands	
9	Brown	Poor	Fine sand	+	Erosional surface with trace of paleosol. Underlying sand.	Fireplaces C-14 samples
10	Light brown	Poor	Fine sand	+		

strata and is discussed in the regional depositional framework in a separate summary report (Coogan 1980). As discussed, the Rousseau site lacks a number of the depositional units present at better preserved localities (for example, the Crow Creek site). The Rousseau profile is similar to the Rattlesnake site (39BF41) in having erosional gullying events evident in the Holocene section as found, for example, at Walth Bay. The fortuitous exposure of a hearth with datable charcoal at the Rousseau site provides the basis for dating one of these late Holocene erosional events between 3900-3300 B.P.

THE LITTLE ELK SITE
(39HU221)

LOCATION

The site is located on the left bank of Lake Sharpe just south of the La Roche bend of the river. The lake is bordered to the east for several miles (left bank side) by the MT-2 terrace. Terrace levels MT-3 and MT-4 lie to the east forming the higher hills in back of the site. These higher terraces are mantled with erratic boulders. An outcrop band of Pierre Shale occurs on the slopes of MT-3 above the gently sloping MT-2 terrace.

GEOLOGIC SETTING

The bank cut along Lake Sharpe exposes the stratigraphic section of MT-2 for a distance of several miles to the south and about a mile to the north. To the north (Figures K-34, K-35A, B) the sequence of deposits from bottom up is Pierre Shale, sandy gravels, and a silt cap with one paleosol. The photographs (Figures K-35A, B) show this sequence and a cut into the gravel layer filled with the overlying sand.

To the south, approaching the Little Elk site (Figure K-36), one sees only the top two units, the sandy unit and the silt cap with one paleosol. The terrace surface slopes downward to a small stream (Figure K-37A, B). It is on the lower part of this slope, in the lake edge cut-bank that two cultural layers were discovered which are described in the archeological report as from the bank profile and Test 2. Test 1 lies on the MT-2 surface to the south and at a higher elevation. The bank profile is at the valley edge (Figure K-37B).

The diagram (Figure K-36) illustrates the setting of Plains Woodland materials recovered from the bank profile and Test 2. Note that the bank profile is cut into a much lower level than the top of

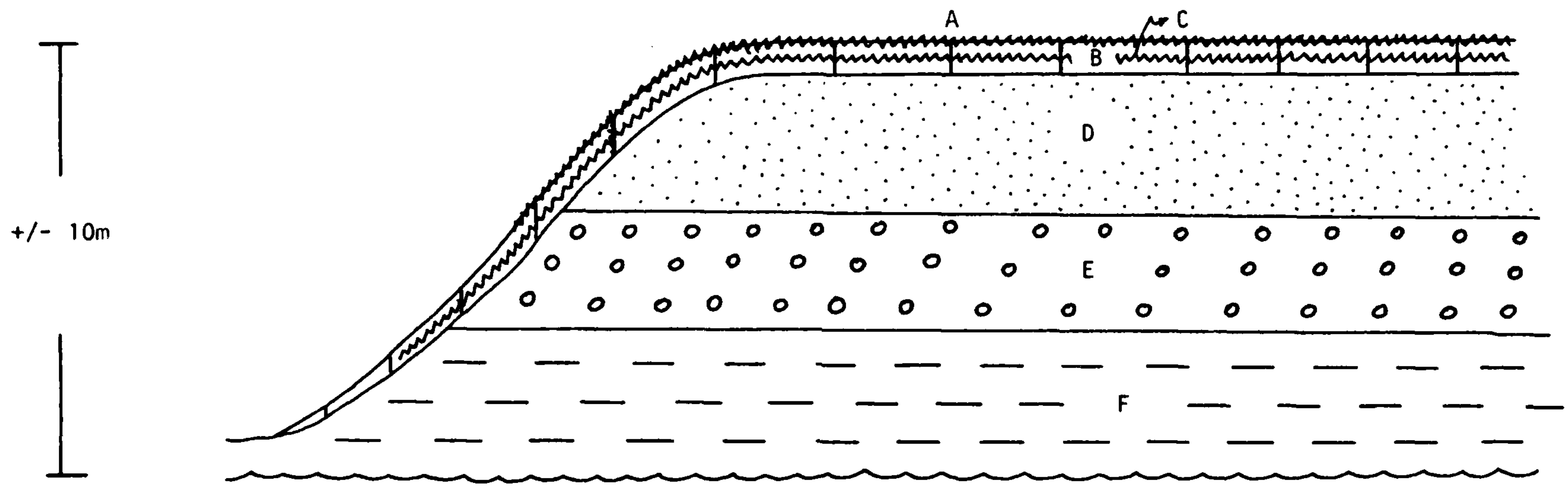
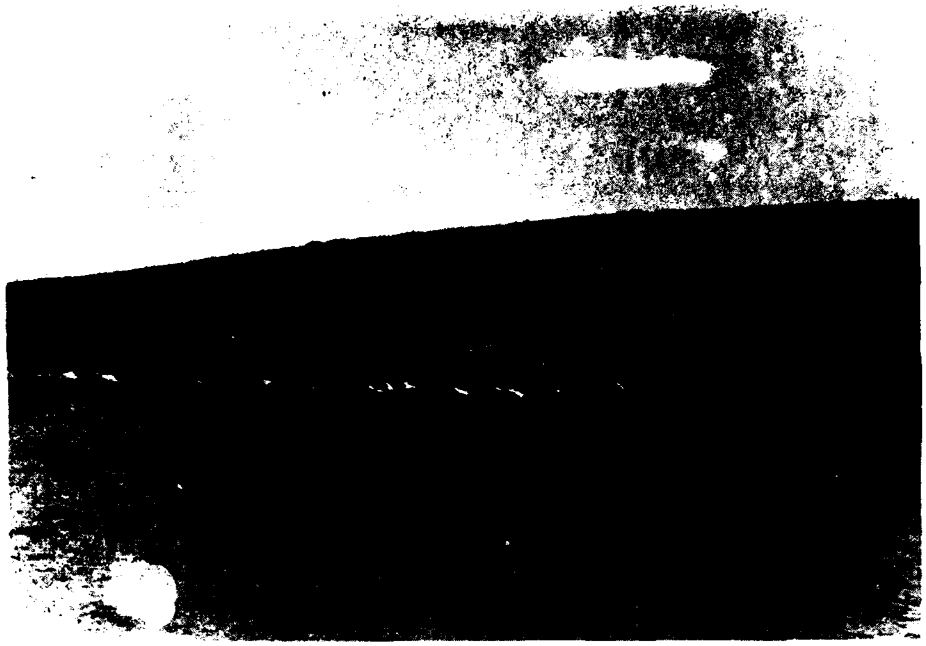


Figure K-34. Diagrammatic cross section of MT-2 terrace bank north of the Little Elk site.
A = Terrace surface
B = Late Holocene silt cap
C = Paleosol in late Holocene silt cap
D = Aeolian sand unit, probably middle Holocene
E = Pleistocene glaciofluvial gravels
F = Pierre Shale

A



B

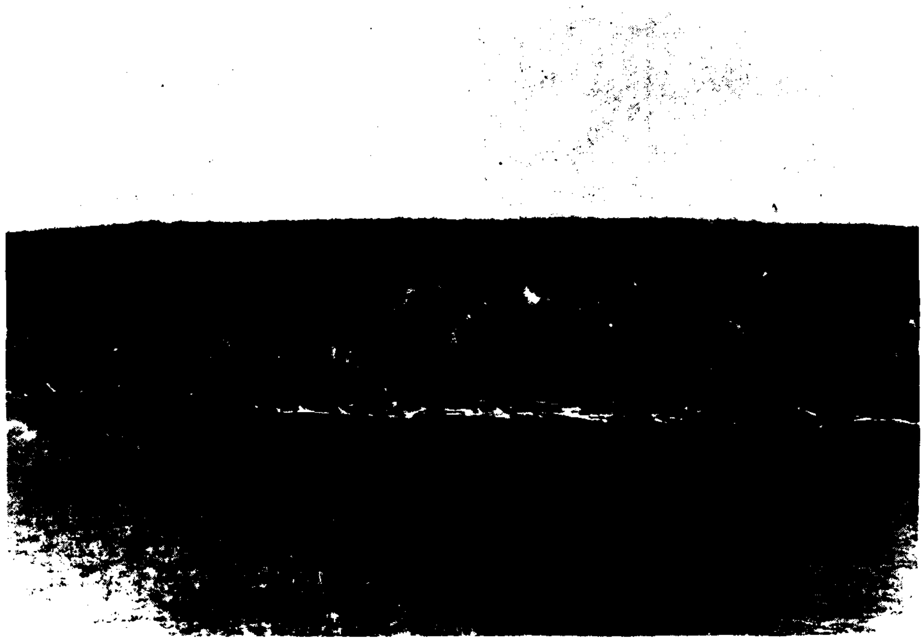


Figure K-35. A) Photograph, view east, showing MT-2 terrace bank in a position described in Figure K-34. B) Photograph in part overlapping and to right of Figure A), showing thicker middle unit (D, Figure K-34) filling a depression in the lower units.

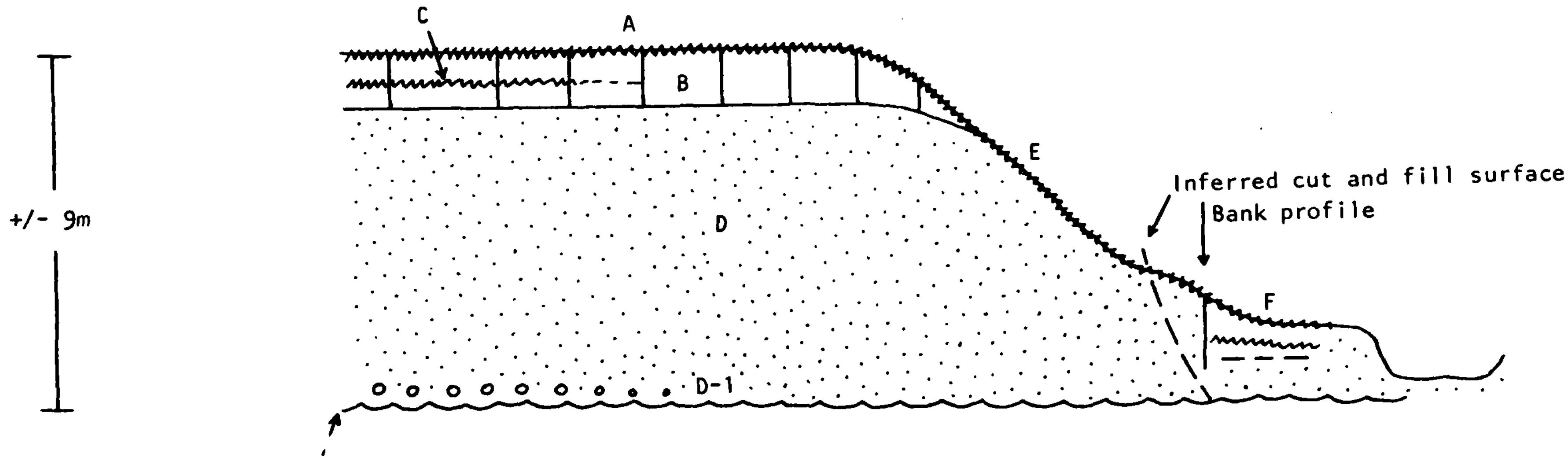


Figure K-36. Diagrammatic cross section of MT-2 terrace bank at the Little Elk site.
A = Terrace surface
B = Late Holocene silt cap
C = Paleosol in late Holocene silt cap
D = Aeolian sand unit
D1 = Gravel lens in lower part of D or top of glaciofluvial gravel
E = Sloping surface of MT-2 into strewn valley
F = Bench at bank profile site of Little Elk
Dashed line is inferred location of cut and fill surface separating bank profile fill from laterally lying D, which is older.

A

B

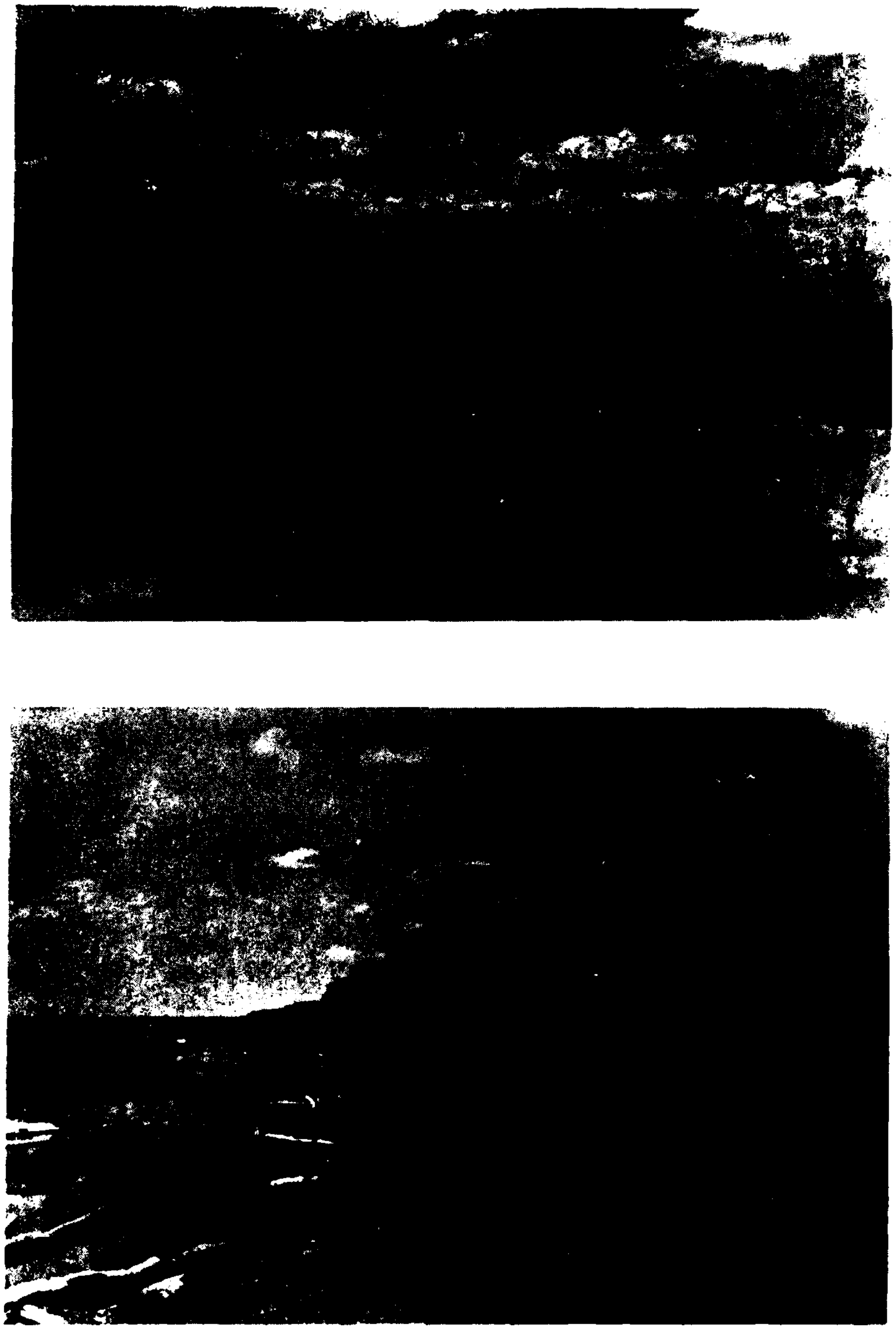


Figure K-37. A) Photographic view of the small valley from Lake Sharpe. Hills in the background are at the MT-4 level. B) View of the bank from the small valley.

the terrace. Given a regular stratigraphic sequence through the fill of MT-2, one should anticipate cultural materials at such a depth to be at least Archaic and emplaced in the middle Holocene sequence of aeolian sand and silt called the Pick City. However, note that the palesol (B) is cut out and that the silt cap is cut out (E) so that the bank profile is taken in a shoulder of the stream edge on the MT-2 slope. Instead of being low in the Pick City equivalent (and probably 6000-8000 B.P.) it is part of a lower and much younger deposit.

A clayey layer (Unit 4, Figure K-38, K-39) appears to be a stream related deposit. The sand overlying it (Units 1-3, 6) appear to represent windblown reworking of sand from the terrace fill. Consequently, the texture of the deposit in the bank profile is similar to that of Unit D (Figure K-36) because it is derived from it, not part of it.

GEOGRAPHIC HISTORY OF THE SITE

Subsequent to the excavation of a valley into the Pierre Shale during the Pleistocene, glacial and glaciofluvial, gravels and sands were deposited on the eroded Pierre Shale surface. These, in turn, were eroded into small hills and valleys. During the Holocene, aeolian sands and silts filled the depressions on the glaciofluvial gravel surface and built up a relatively thick, sandy deposit which at Little Elk forms the major part of the fill of MT-2. In the late Holocene, aeolian deposition was predominantly silty, building up a deposit on the terrace top of fine silt, At least one paleosol, probably one of the older of the three late Holocene paleosols (see Coogan 1980) is present in this silt but cut out laterally by various factors of deposition and erosion adjacent to the small valley (K-36).

As the valley cut through the terrace to the flood plain of the Missouri River and then migrated and filled in a portion of the cut valley with stream and then aeolian sediment, a bench was formed (Figure K-36) of more recent sediment in which the Plains Woodland

Figure K-38. Photograph of the excavation of the bank profile. Position of the trowel is Unit 2 of the profile. Unit 4 is interpreted as a clay layer deposited by the stream which cut the small valley.

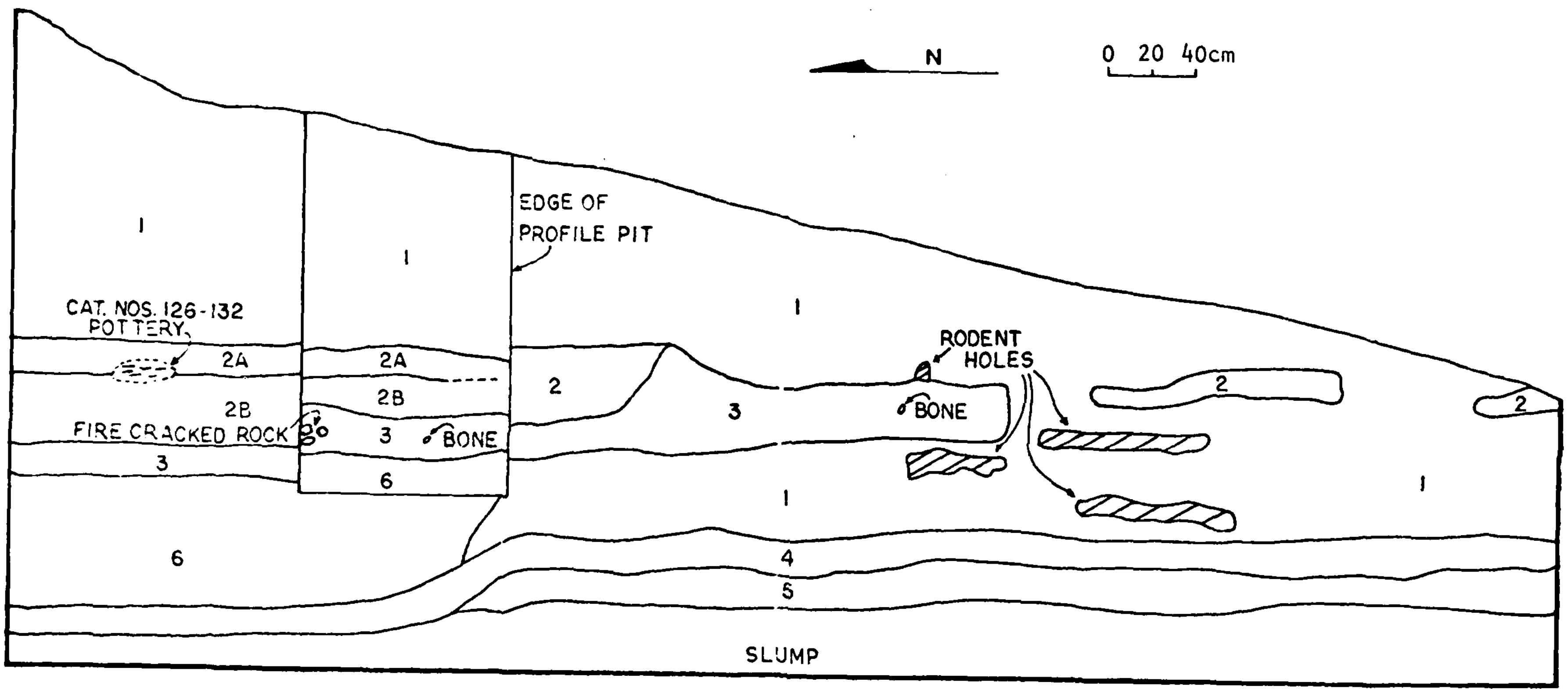


Figure K-39. Stratigraphic section at the bank profile. Units numbered the same as in the archeological site report. Units 2A, B and 3 may represent a soil stabilization zone. Unit 4 is interpreted as a water-laid clay.

material was found. An estimated date for the cutting of the valley is no more than 4000-5000 B.P., probably younger. The Plains Woodland date is consistent with a paleosol development at either 2000 or 1000 B.P.

Test 1 was not observed in the field. The profile and location of the test suggest that all the materials lie in the upper portion of Unit B (Figure K-36), above the uppermost paleosol in this depositional sequence.

THE WHISTLING ELK SITE (39HU242): PRECERAMIC COMPONENT

LOCATION

The Whistling Elk site lies at the present edge of a broad portion of the MT-2 terrace's border with Lake Sharpe immediately south of the former location of the DeGrey School. North of the MT-2 terrace, at the point where South Dakota Highway 34 crosses the area, portions of the MT-3 terrace are evident (Figure K-40).

The bank cut at the site reveals ca. 4m MT-2 terrace fill and contains more than a dozen recognizable stratigraphic units representing depositional sequence mainly during the Holocene.

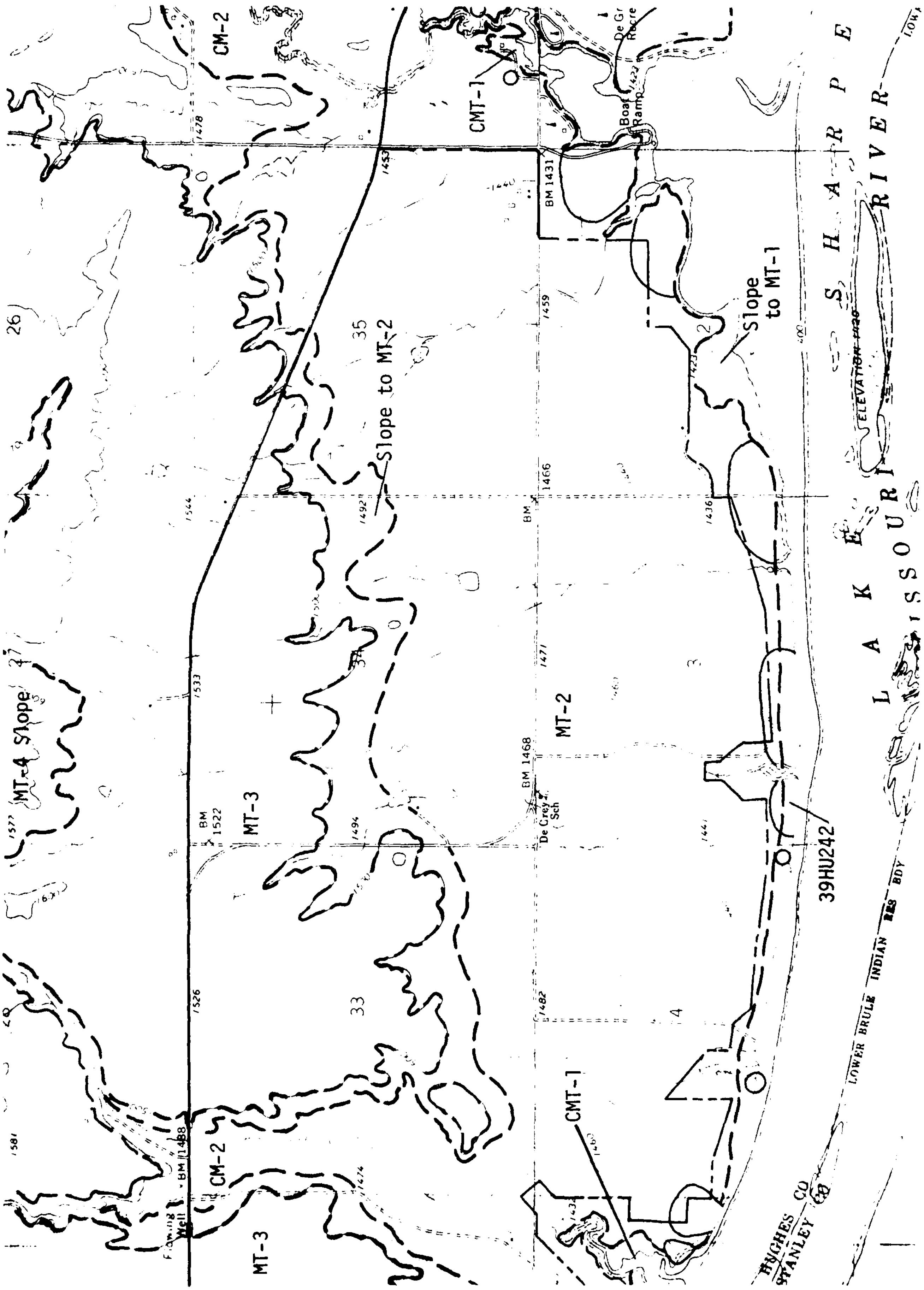
THE BANK STRATIGRAPHIC PROFILE

The bank profile (Figure K-41) in its upper two meters consists of tan to-greyish-tan very fine sandy silt (Units A-G). These upper fine sand and silt units are subdivided by two darker paleosols or soil stabilization horizons (Table K-11).

The middle sequence of units (Units I-K)--which combined about 1m of sediment--consists mainly of reddish-brown clay with caliche specks. The clay includes fragments of eroded Pierre Shale bedrock. A cultural layer with stone concentration (Feature 21; see Section A, Appendix 1) and cracked bone was found exposed in the bank cut in these units (Figure K-41).

The lower part of the profile consists of fine sand which is bedded or faintly cross bedded.

Inspection of the bank profile to the east, from the site proper to an irrigation ditch installation (ca. 800 ft.), shows lateral changes in the sequence (Figure K-42). At a section in the bank near the irrigation installation, Units I-K of the bank profile show thin gravel lenses consisting of fragments of the eroded bedrock Pierre



CM-2
CMT-1
Boat Ramp
BM 1431
Slope to MT-1
LAKE SHARPE
MISSOURI RIVER
ELEVATION 1420
26
35
Slope to MT-2
MT-4 Slope
27
MT-3
BM 1522
BM 1468
De Grey Sch
MT-2
34
33
3
4
39HU242
LOWER BRULE INDIAN RES BDY
CMT-1
CM-2
BM 1488
Flowing Well
MT-3
HUGHES CO
STANLEY CO

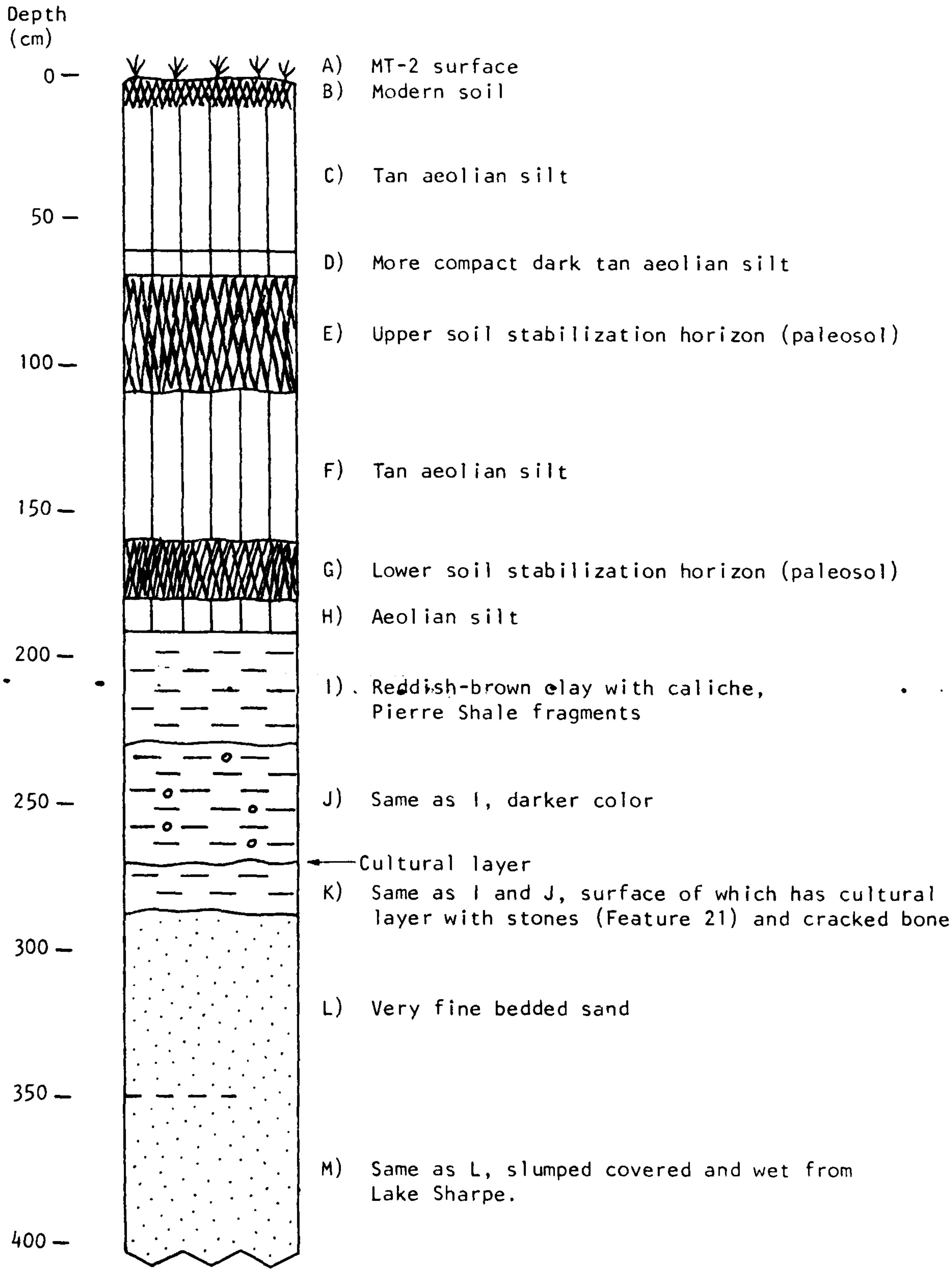


Figure K-41. The bank profile at the site.

Table K-11. Binocular microscope description of samples from the bank profile at site 39HU242.

Unit	Description
1	Unit C. Tan medium to coarse silt, about 90%. 10-15% dark ferromagnesian minerals including fresh mica (less than 1%). 20% of coarse silt into the very fine sand range. Sorting very good.
2	Unit D. Dark tan sandy quartz silt. Silt medium to coarse, sand very fine. Quartz is 85%, ferromagnesian minerals including fresh mica about 15%. Few well rounded, polished medium quartz grains. Sorting good.
3	Unit E. Dark tan to brown, medium coarse silt and very fine sand. Well sorted. Quartz about 85%, 15% very fine to fine lithic fragments and ferromagnesian minerals including fresh mica (less than 1%).
4	Unit F. Light tan, very fine quartz sand more than 90%; 10% ferromagnesian minerals including fresh mica. Sorting very good.
5	Unit G. Compact, dark tan, very fine quartz sand about 90%; 10% fine ferromagnesian minerals including fresh mica.
6	Unit I. Compact, very calcareous, grey, clayey quartz medium-fine silt with compact and elongate streaks of caliche which are clumps of crystals at high magnification. About 10-15% dark ferromagnesian minerals and fragments of Pierre Shale.
7	Unit J. Compact, greyish, clayey quartz silt with 20% medium to coarse rock fragments from the Pierre Shale. Calcareous. Few medium to coarse subangular quartz grains.
8	Unit K. Grey, compact clayey quartz silt, calcareous, with specks of white caliche. 20% coarse Pierre Shale fragments and ferromagnesian minerals.

Shale. Below the I-K interval is a bedded unit of gravel in which the gravel particles are of glacially derived materials and of Pierre Shale bedrock (Unit N, Figure K-42). Lying below Unit N are fine bedded sands which laterally interfinger with thin beds of clay (Unit O, P, Figure K-42).

INTERPRETATION OF THE PROFILES

The upper units of both profiles (Units A-H) represent the late Holocene aeolian silt corresponding to the Riverdale member of the Oahe Formation (see Figure K-6). The presence of at least two paleosols in the sequence indicates that the upper portion of the site profile is in the more depositional regime of Holocene deposition and erosion. No radiocarbon or cultural stratigraphic dates are available to indicate which paleosols in the bank profile are equivalent to those of the Riverdale sequence, and there were no strong erosional downcutting surfaces to assist in the interpretation. A tentative suggestion is that the lowermost paleosol (Unit G) was probably formed ca. 2000 B.P. The upper paleosol (Unit E) would then be dated ca. 1000 B.P.

The lower portions of the section are much harder to interpret. Basically, there are two alternatives. The first is that the clay represents local slope wash from eroding Pierre Shale bedrock. As such, the clay content is the result of local source materials. It would be convenient to have the clay deposited in a small pond. The difficulties with this interpretation, however, are that the pond would have been in existence at the time of the predominantly dry, warm middle Holocene period equivalent to the Pick City--if the overlying paleosol is older than assumed. If the overlying paleosol is properly dated at 2000 B.P., the lake could have formed during the wetter, cooler 3000-4000 B.P. time. In any case, the cultural layer in the clay sequence found in Unit J is preceramic and consistent with a pre-2000 B.P. date for the clay disposition.

The second alternative is that the clay is a lake deposit related to backswamp or lake deposits of a fluvial regime in the Missouri River.

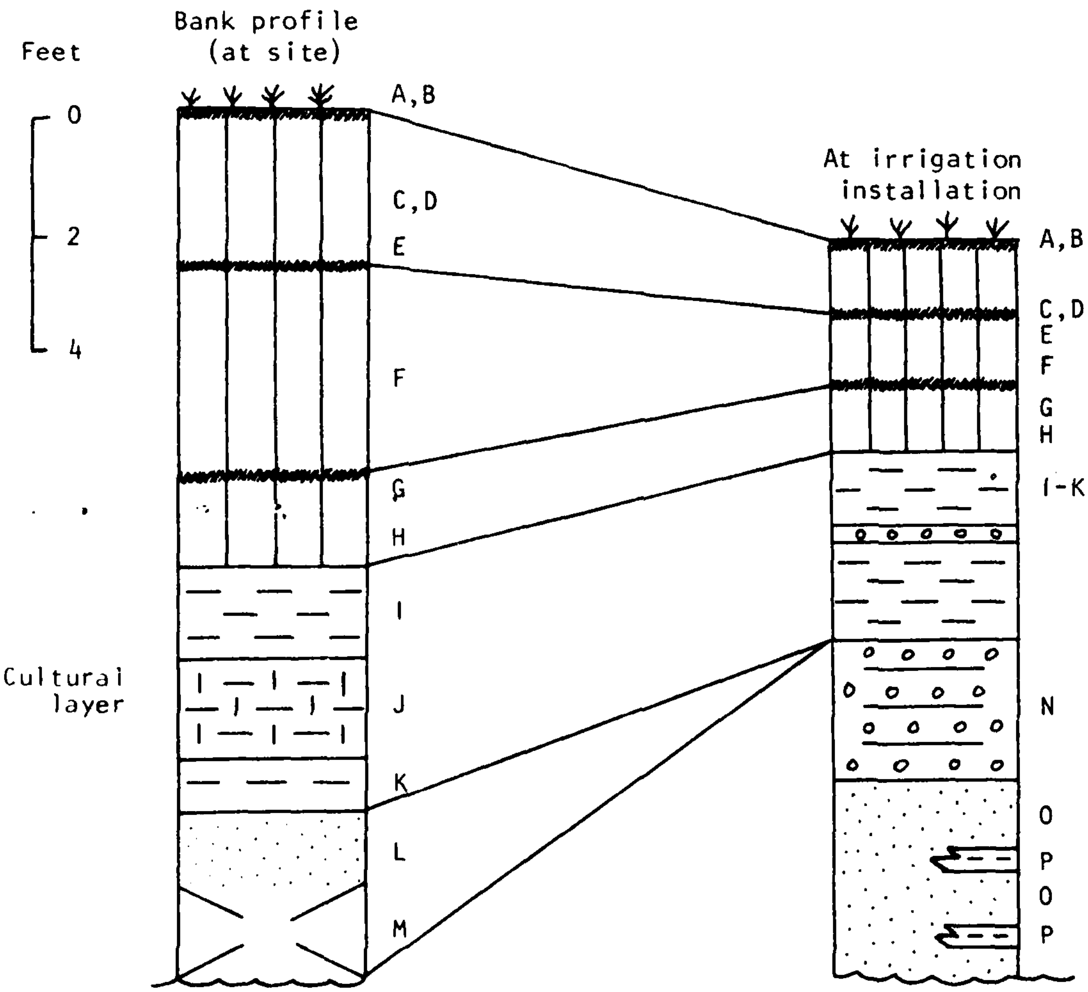


Figure K-42. Correlation of units between bank profile at the site and bank profile at the irrigation installation. Letters in left column as in Figure K-41. Letters in right column as in Figure K-41 with additions as follows:
N = glaciofluvial gravel layer of Pierre Shale fragments and glacial debris
O = fine bedded sands
P = interfingering clay layers in Unit O

As such, the clay interval would be much older, perhaps as old as 10,000 B.P. or older. This would imply no record of middle Holocene deposition of aeolian materials equivalent to the Pick City.

Of the two alternatives, the former seems more consistent with the few facts available. The sand unit (Units L, M) in the site bank profile accordingly represent either Pleistocene fluvial deposits consistent with the first alternative or the middle Holocene aeolian sands equivalent to the Pick City consistent with the second alternative.

The correlation section along the bank between the site and the irrigation installation (Figure K-42) shows an interpreted equivalence of the clay units (Units I-K) which is confirmed by traversing the whole bank. The underlying gravel (Unit N) is cut out by erosion between the two profiles suggesting that the sand (Units L, M) of the site bank profile is younger than the gravel and more likely the middle Holocene aeolian Pick City equivalent.

The gravel unit (N) is interpreted as glaciofluvial outwash or colluvial slope wash of Pleistocene age. The underlying sands and the interfingering clays are interpreted as fluvial sand and slack water fluvial deposits of the Pleistocene. If the interpretation of the formation of the fill of MT-2 in response to a daming of the Missouri by ice near Yankton (see Coogan 1980) is correct, these sands and clay may represent a record of that fluvial and lacustrine event.

The current interpretation of the sequence of deposits as shown in the two profiles is summarized in Table K-12. Given the alternative listed above, a single date or diagnostic archeological find could revise the interpretation.

COMPARISON OF TEST PITS WITH THE BANK PROFILE

Several tests were excavated on the terrace surface as much as 150m north of the bank. The natural stratigraphy of the pits was not inspected in conjunction with this study. However, based on the descriptions of the tests, a tentative correlation of the units is shown in Figure K-43. Units A-D represent deposition of the upper

Table K-12. Sequence of geologic events evident in bank profiles near Whistling Elk (39HU221).

Event	
1	Deposition of the fluvial or lacustrine sands and clays (Units O, P) over the eroded bedrock Pierre Shale.
2	Deposition of glacifluvial or colluvial gravels (Unit N).
3	Erosion of the surface of the Unit N deposits--late Pleistocene, possibly early Holocene.
4	Deposition of aeolian sands (Units L, M) on the eroded surface. Middle Holocene.
5	Deposition of clays derived from upslope weathering and erosion of the Pierre Shale in small ponds. Late Holocene.
6	Deposition of aeolian silt during the late Holocene interrupted by two periods of soil stabilization and formation of paleosols.

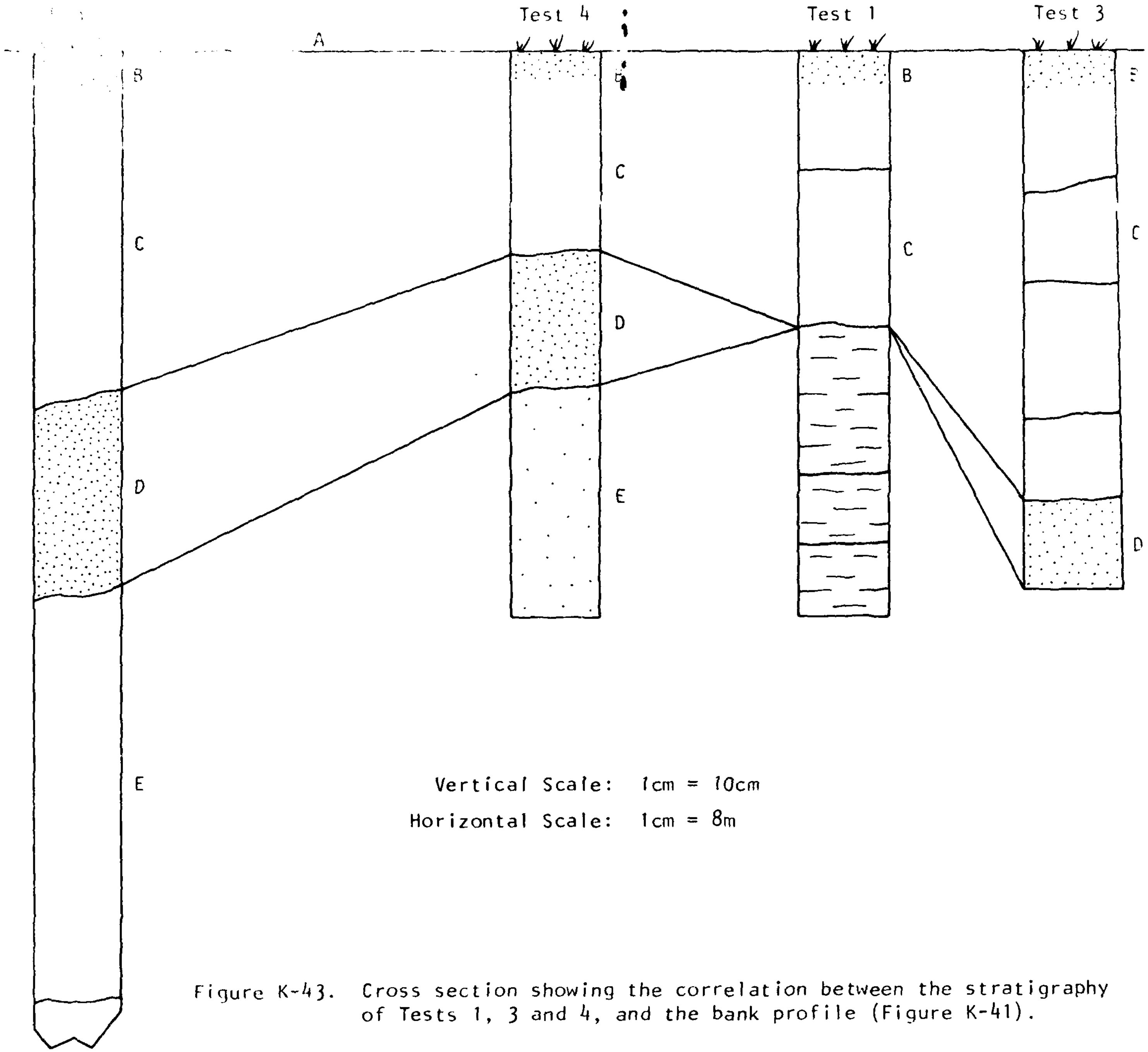


Figure K-43. Cross section showing the correlation between the stratigraphy of Tests 1, 3 and 4, and the bank profile (Figure K-41).

silt cap (late Holocene) interrupted by paleosol formation. The paleosol seen in the bank (Unit E) appears equivalent to Unit D of Tests 3 and 4. It is missing in Test 1. Unit F of Test 1 may be the equivalent of Units I-K of the bank profile.

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VOLUME III

APPENDIX 1

ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

SECTION L

ARCHEOLOGICAL INVESTIGATIONS IN THE BIG BEND RESERVOIR: A REVIEW

by

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APPENDIX 1, SECTION L

ARCHEOLOGICAL INVESTIGATIONS IN THE BIG BEND RESERVOIR: A REVIEW

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APPENDIX 1, SECTION L

ARCHEOLOGICAL INVESTIGATIONS IN THE BIG BEND RESERVOIR: A REVIEW

LIST OF TABLES

OVERVIEW

Excavation and analysis of archeological remains within the Big Bend Reservoir profited immensely from the salvage experience gleaned in the Oahe and Fort Randall projects, both of which were begun almost a decade earlier. Accumulated experience in the organization and management of large field establishments was of vast importance, but even more significant were the pioneering syntheses of Middle Missouri prehistory that were emerging in the early 1950s (Hurt 1951a; Lehmer 1952, 1954). Yet in 1956, when systematic work began in the Big Bend, there was still pitifully little known about the village complexes of the area, and their Woodland and preceramic precursors were largely conjectural.

Archeological concerns within the Middle Missouri region of the Dakotas have been of long standing but relatively little fieldwork (and publication) has been completed. In effect, the sites had been by-passed in favor of more lucrative data and more spectacular results elsewhere. As late as 1951, after several seasons of intensive work in mainstream reservoirs, Lehmer was compelled to rely upon only a handful of sites and components in developing the first serious cultural sequence broadly applicable to the Middle Missouri.

The prehistorians working in the Middle Missouri in 1956 seemed wiser than they were. True, certain basic outlines were drawn and a theoretical frame-work of sorts existed, but it was largely broad-brush and many of the strokes were faulty. As late as 1958, in the "Appraisal of the Archeological Resources of the Big Bend Reservoir, South Dakota", Huscher and McNutt were limited to such a statement as:

> Present information indicates three major horizons in the Big Bend and adjacent areas: (a) an earlier one during which fortifications are associated with square and long-rectangular houses and cord-marked pottery; (b) a horizon characterized by large and often diffuse settlements of circular houses with simple-stamped pottery; (c) a late horizon distinguished by compact, circular, fortified

villages of large round houses with simple-stamped pottery and trade goods of European origin (Huscher and McNutt 1958:22).

Moreover, among Plains archeologists there was still a tendency to use such diffuse shorthand as "Riggs-like", or if speaking of ceramics, "in the Iona-La Roche series", etc., without any further precision. Indeed, more precise definition was often impossible. This speaks directly to the sparcity of data then available and, in some degree, to the fuzziness of thought engendered by the theoretical framework then in vogue (Caldwell and Henning 1978: 114-116). It should be stressed that despite the apparent imprecision of usage, there was a considerable degree of communication. Throughout the period of mainstream archeological salvage, Plains prehistorians were a close-knit group, interacting regularly and frequently. Furthermore, until the 1960s, most of them shared a common background. Lehmer's concern with cultural complexes in Nebraska was not accidental. For a decade, at least, Plains prehistory was Nebraska prehistory and the terminology "Upper Republican", and "Nebraska", whether phrased as culture or aspect, were widely recognized among archeologists. In addition, most prehistorians associated with the Plains were experienced in Nebraska and/or were trained by W. D. Strong, who instituted systematic archeology at the University of Nebraska, Lincoln. They formed the cadre of Smithsonian Institution archeologists who planned and carried out salvage in the Missouri River reservoirs and staffed many of the archeological programs in state universities throughout the basin. The heritage was enhanced with the establishment of the Missouri Basin Project, Smithsonian Institution in Lincoln. It shared facilities and viewpoints with the Department of Anthropology, University of Nebraska, and formed relationships that continued for many years.

By the middle 1930s, the McKern or Midwestern Taxonomic System (MTS) had become established as the vehicle for organization and comparison of archeological data within the Central Plans. Rather quickly (and inadvertently) it lost its spaceless, timeless qualities

and in its modified form, came to be widely used for identifying and ordering the emerging cultural complexes of the Middle Missouri. With the surge of new data, however, "inevitably the MTS in its ad hoc "Plains" character was subject to re-examination" (Champe 1961; Caldwell and Henning 1978:115). During the "Accidental" (or 10½) Plains Conference in the summer of 1953 (Stephenson 1954), the then current taxonomic units were re-examined and as a group, Plains archeologists "came to grips with the canon of the MTS, 'reclassifying' entities by morphology alone and only subsequently considering factors of time and space" (Caldwell and Henning 1978:115). The results, embodied in Stephenson 1954 served well and still retain more than historical interest despite recent use of more effective schemes. Even before the Accidental Plains Conference, Donald J. Lehmer had experimented with a new approach considering both space and time.

> Sites and components were phrased within the MTS, but evident continuities were recognized through the content of branch, which was transferred from the Southwest where it connected 'cultural development through time within a limited geographic area' (Lehmer 1954:117). Moreover, the Fort Pierre Branch, encompassing the *principal* sites..., was placed within the context of three traditions, Central Plains, Middle Missouri, and Coalescent, units of the Plains Village Pattern...(Caldwell and Henning 1978:116).

Lehmer's conceptual framework has endured although the idea of the branch has found no favor. Modifications and additions have been made. The traditions and the site units, largely as originally defined, have been embroidered into a modified form, the so-called "Willey and Phillips scheme" (Willey and Phillips 1958) which among other concerns relies upon time and space as well as material remains as cultural building blocks (Lehmer and Caldwell 1966; Caldwell and Jensen 1969). Still other modifications have followed. The most significant, perhaps, is the introduction of the variant to describe regional versions of the basic cultural configuration (Lehmer 1971:33; Krause 1969:94-96; Caldwell and Henning 1978:130).

The archeologist is thus left with a number of conceptual frameworks, each of which has had its day. Differences are not always clear-cut or clearly articulated so that one is often faced

with an implicit eclecticism that requires deciphering. Fieldwork within the Big Bend, and subsequent analysis and synthesis has been influenced by each of the conceptual schemes. Each still has adherents and changes or "improvements" that are not universally accepted so that published statements, particularly those of a comparative nature, must be approached cautiously and with full expectation of occasional conceptual confusion.

THE FIELDWORK

In common with much of the western United States, the Big Bend area received little attention from prehistorians prior to the beginning of the federal water control programs. The area was not entirely unknown. During the summer of 1918, W. H. Over, Director of the University of South Dakota Museum, and Freeman Ward, State Geologist, visited the area while jointly surveying the geology and natural history along the Missouri (Meleen 1948:1). Over recognized a number of important archeological sites; his field notes are somewhat confused (and confusing) in regard to legal definitions but they served as guides for the initial survey by the Smithsonian Institution in 1956.

Although the Over data was known to a few, no intensive excavation was attempted for more than two decades and it was more than 30 years before a large scale, systematic program of survey was begun. In the interim, the Big Bend country was visited by Alfred W. Bowers who conducted archeological fieldwork in the Dakotas for the Logan Museum, Beloit College, during 1929, 1930 and 1931. The results were important but were not available for many years. Ultimately the data served as a basis for a Ph.D. dissertation (Bowers 1948) but it remains unpublished and is now obsolete. The manuscript was made available to the Smithsonian Institution after the beginning of the Big Bend survey. It served as a useful guide despite the inevitable confusions of legal definition.

During 1939, a field party from Columbia University excavated at the well-known Arzberger Site (39HU6), one of the largest and most

impressive villages in the area that was to become the Big Bend Reservoir. Incidental excavation was also done at the Buffalo Pasture Site (39ST6) to the northwest. Both projects derived from the long-standing concerns of W. D. Strong, then at Columbia, for Plains prehistory. A preliminary statement of results was published the following year (Strong 1940) but a complete analysis did not appear until the autumn of 1956 (Spaulding 1956) after completion of the initial season of survey.

In 1947, after yet another lapse of years, the South Dakota Archeological Commission sponsored excavations at the La Roche Site (39ST9), a well known village in the middle reaches of the Big Bend country, and at the same time, the nearby Sommers Site (39ST56) was sampled (Meleen 1948; Hurt 1951b).

By 1950, intensive archeological survey was underway both in the Oahe and Fort Randall Reservoirs, respectively to the north and south of the Big Bend. It was realized quite early that none of the pool areas were isolated and that they must be studied as a unit despite arbitrary limitations of construction and funding. It was assumed that the Big Bend area must hold important comparative data. Thus, the Missouri Basin Project excavated at the McClure Site (39HU7) near Arzberger, in 1952, and probes were made upstream from Fort Randall into the Big Bend area. The latter was feasible because it was anticipated that the Randall pool, at maximum storage level, would back water upstream well into the Big Bend. With this justification, University of Kansas field parties excavated at the Talking Crow Site (39BF3) during the seasons of 1950-1952 (C. S. Smith 1951: 1977), and subsequently in 1955, excavated at the Two Teeth Site (39BF4), (see Smith and Johnson: 1968), and tested site 39HE202 well upstream.

Unfortunately, most of the Big Bend data remained in the form of notes or preliminary and immature summaries. In effect, work in the Big Bend Reservoir began from a zero base but it was supported strongly by the important syntheses published by Cooper (1949), Hurt (1951b, 1952, 1953) and Lehmer (1954). The latter, based upon

an archeological sequence from the Dodd Site (39ST30) in the lower Oahe Reservoir, provided the conceptual framework that was to guide the Big Bend program, and ultimately lead to a synthesis of Middle Missouri prehistory (*supra*).

Archeological survey of the Big Bend Reservoir began during the summer of 1956. Work was intensive, and continued through the field season of 1957. The results, in final form, were not available until October of the following year (Huscher and McNutt 1958). The survey and the subsequent excavation of most of the sites was done by the Smithsonian Institution through the Missouri Basin Project, headquartered in Lincoln, Nebraska. A number of sites was already on record (*supra*) and in addition, the lower portion of the reservoir had been examined "in connection with a preliminary appraisal of the Fort Randall Reservoir area" (see Cumming 1953; Huscher and McNutt 1958:17). Including those previously known, the survey party recorded a total of 165 sites (ibid:20).

Archeological sites were classified rather arbitrarily as villages, camps, etc., largely on the basis of presence or absence of surface depressions or dense concentrations of artifact materials. Sites showing little surface material and no putative lodge depressions automatically became "camps". Eighty-three sites were designated as villages; nineteen of them appeared to be fortified. Village bounds again, were designated by the archeologist and did not necessarily coincide with the original community. In many areas, cultural debris was more or less continuous along the river terraces. Often, there was no cultural basis for division so that natural features such as gullies were utilized as perimeters. It was realized that "Such arbitrary divisions are useful in keeping specimen collections separate, but they may do violence to cultural reality" (op cit.). Campsites were numerous and varied. A few seemed to be pre-ceramic and thus were of particular importance. Others contained heterogeneous ceramic remains and still another group appeared to document the historic Dakota occupation. A concentration of low mounds found in the Fort Thompson area was deemed worthy of special note.

Nowhere along the Missouri had a comparable group been found. Ultimately, 23 sites, containing at least fifty mounds, were recorded. Later, as excavation and experience increased, still other mounds were added to the roster in other areas.

In assessing the significance of the archeological remains within the reservoir, it was asserted grandiloquently that the sites "represent invaluable clues which pertain to almost every major problem of Northern Plains archeology" (Huscher and McNutt 1958:65). Specifically, Pre-ceramic occupations, the Woodland horizon, and a number of topical problems were mentioned (ibid: 66 *et seq.*). It was assumed that the Big Bend held "vital information concerning the various fortified and unfortified long-rectangular house occupations, additional data relating to the Arzberger Site, the basic outlines of the La Roche-like occupations, and additional comparative information which may be pertinent to the early and late periods of the Stanley Focus" (op cit:70).

In a concluding statement, it was recommended that 40 of the 103 major sites receive extensive excavation. Twenty of these, selected to maximize information retrieval, were to be mapped and tested. Sixty-six additional sites were recommended for testing, others subject to limited tests and 16 to receive no excavation at all.

The recommended program was ambitious and probably as carefully phrased as was possible at that time. Moreover, it contained a statement of problems, admittedly somewhat diffuse, but as specific as was feasible in view of the conceptual sophistication and the state of knowledge of Big Bend archeology. The authors saw clearly that some foci were not warranted, that cultural entities needed definition (or redefinition) and that numerous relationships demanded clarification (Huscher and McNutt 1958:65-71).

In retrospect, the Big Bend program as it developed, adhered rather closely to the recommendations of 1958 despite archeological complexities, vagaries of funding and political realities that were unanticipated at the time. The program maintained a coherency and momentum because it was conceived and executed by a single agency.

Except for the involvement of the University of Kansas prior to the beginning of the Big Bend Project and later at the Stricker Site (39LM1), all of the work was in the hands of the Missouri Basin Project - Smithsonian Institution. Even the volunteer excavations at 39LM223 were under Smithsonian auspices. There were problems, of course, but in most cases they stemmed from federal administrative requirements and personnel procedures, as well as unpredictable fluctuation of appropriated funds. In addition, it was necessary to anticipate construction plans and construction schedules so that a planned archeological attack with systematic increments of data was possible. A case in point was that of the Black Partizan Site (39LM218) excavated in 1957 and 1958 (Caldwell 1960, 1966) simply because it lay on an alternative route for the Big Bend spillway. It had been recommended for extensive excavation because it was fortified and was thought to relate to the long-rectangular house occupation (Huscher and McNutt 1958:68-79). The site proved to have quite different and, in the long run, more important cultural affinities but the discovery was serendipitous and not the result of planning.

By the end of 1968, dam construction was substantially complete and the reservoir pool quite high. As of that time, a final shoreline survey had been completed and a total of 89 sites had been excavated or tested in some degree (Table L-1). Thirty-six had been tested only, although "test" sometimes covered a fair number of small (usually 5x5 ft.) excavations at a single site. The remainder were excavated. "Excavation" implies that at the very least a house or a large portion of a house was exposed, or that there was rather extensive trenching, or the exposure of other significant features (such as a mound). No dimensional criterion can be applied.

Only 21 of the 40 sites recommended for extensive excavation were indeed excavated. Some were merely tested, or for various reasons (*infra*), were ignored. Yet in addition to those of the "recommended" group, still another 19 sites received intensive or extensive excavation and 30 were tested. Among the latter were

Table L-1. A summary of Big Bend area fieldwork, 1956-1968.

Year	Site	Nature of Work	Excavator	Institution
1957	39LM241 (Ft. Defiance-Bouis) Putative Trading Post	Large scale excavation	G. H. Smith	RBS-SI
	39LM218 (Black Partizan) Village	Large scale excavation	W. W. Caldwell	RBS-SI
	39BF12 (Pretty Bull) Village	Large scale excavation	R. W. Neuman	RBS-SI
	39BF221 Village	Small excavation ?	R. W. Neuman	RBS-SI
	39BF223 Mound	Large scale excavation	R. W. Neuman	RBS-SI
	39BF224 Mounds	Large scale excavation	R. W. Neuman	RBS-SI
	39BF2 (Medicine Crow)	Large scale excavation	W. N. Irving	RBS-SI
	Survey continued Tests: 14 sites in BF, HD, HU, LM and ST counties			
1958	39BF2 2nd season	Large scale excavation	W. N. Irving	RBS-SI
	39BF238	? (test)	W. N. Irving	RBS-SI
	39BF250	? (test)	W. N. Irving	RBS-SI
	39BF215 (Aiken)	? (test)	W. N. Irving	RBS-SI
	39BF2	Large scale excavation	J. F. Deetz	RBS-SI
	39BF221 (Akichita)	Large scale excavation	R. W. Neuman	RBS-SI
	39BF220	Large scale excavation	R. W. Neuman	RBS-SI

Table L-1. A summary of Big Bend area fieldwork, 1956-1968 (continued).

Year	Site	Nature of Work	Excavator	Institution
	39BF224 (Truman) Mounds	Large scale excavation- 2 mounds	R. W. Neuman	RBS-SI
	39BF270 4 Mounds	Large scale excavation- 3 mounds	R. W. Neuman	RBS-SI
	39LM238 Mound	Small scale excavation	R. W. Neuman	RBS-SI
	39LM239 Rock Shelter	Test	R. W. Neuman	RBS-SI
	39LM6 Multi-component occupation	Cache pit salvated	R. W. Neuman	RBS-SI
	39LM4 (Hickey Bros.) Village	Extensive excavation	B. Golden	RBS-SI
	39LM218 Continued	Extensive excavation	W. W. Caldwell	RBS-SI
	39LM215 (Peterson) Village	Extensive excavation	W. W. Caldwell	RBS-SI
1959	39LM4	Small scale excavation	W. W. Caldwell	RBS-SI
	39LM221 Mounds	3 of 4 excavated	W. W. Caldwell	RBS-SI
	39LM220 Village	Small scale excavation	W. W. Caldwell	RBS-SI
	39LM219 Village	Small scale excavation	W. W. Caldwell	RBS-SI
	39LM216 Village	Small scale excavation	W. W. Caldwell	RBS-SI
	39LM230 "Camp"	Test	W. W. Caldwell	RBS-SI
	39LM88 "Camp"	Test	W. W. Caldwell	RBS-SI

Table L-1. A summary of Big Bend area fieldwork, 1956-1968 (continued).

Year	Site	Nature of Work	Excavator	Institution
	39LM214 (Tom Rattler)	Test	W. W. Caldwell	RBS-SI
	39LM6	Extensive test	W. W. Caldwell	RBS-SI
	39LM234	Extensive test	W. W. Caldwell	RBS-SI
	39LM89 "Camp"	Limited test	W. W. Caldwell	RBS-SI
	39LM240 "Camp"	Limited test	W. W. Caldwell	RBS-SI
	39LM235 (Good Soldier Creek)	Extensive test	W. W. Caldwell	RBS-SI
	39LM237 Mounds	Limited test	W. W. Caldwell	RBS-SI
	39LM236 "Camp"	Limited test	W. W. Caldwell	RBS-SI
1960	39LM222 Village	Large scale excavation?	W. W. Caldwell	RBS-SI
	39LM224 Village, Mounds	Limited excavation	W. W. Caldwell	RBS-SI
	39ST202 (Fort George) Historic	Limited tests	G. H. Smith	RBS-SI
1961	39BF225 (Sitting Crow) Mounds	Large scale excavation 3 mounds	R. W. Neuman	RBS-SI
	39BF233 (Side Hill) Mounds	Large scale excavation 4 mounds	R. W. Neuman	RBS-SI
	39BF234 (Old Quarry) Mounds	Large scale excavation 1 mound	R. W. Neuman	RBS-SI
	39LM232 (Pretty Head)	Extensive excavation	W. W. Caldwell	RBS-SI

Table L-1. A summary of Big Bend area fieldwork, 1956-1968 (continued).

Year	Site	Nature of Work	Excavator	Institution
1962	39LM208 (Jiggs Thompson) Village	Limited excavation	W. W. Caldwell, R. E. Jensen	RBS-SI
	39LM209 (Langdeau) Village	Limited excavation	W. W. Caldwell, R. E. Jensen	RBS-SI
	39LM2 (Medicine Creek) Village	Limited excavation	W. W. Caldwell, R. T. Carter	RBS-SI
	39LM225 (Jandreau) Village	Limited excavation	W. W. Caldwell, R. T. Carter	RBS-SI
	39LM226 (Gilman) Village	Extensive test	W. W. Caldwell, R. T. Carter	RBS-SI
	39LM228 Village	Test	W. W. Caldwell, R. T. Carter	RBS-SI
	39LM249 Village	Test	W. W. Caldwell, R. T. Carter	RBS-SI
	39LM250 Village	Test	W. W. Caldwell, R. T. Carter	RBS-SI
	39ST202 (Fort George)	Extensive excavation	G. H. Smith	RBS-SI
	39LM223 (Black Dog) Village	Extensive test	V. R. Helman (asstd. by RBS)	Volunteer
1963	39LM247 Indian Agency	Tests	G. H. Smith	RBS-SI
	39HU301 (on Cedar Island) Historic site	Test	R. H. Smith	RBS-SI

Table L-1. A summary of Big Bend area fieldwork, 1956-1968 (continued).

Year	Site	Nature of Work	Excavator	Institution
	39HU213 (St. John) Village	Extensive test	R. E. Jensen	RBS-SI
	39HU222 (Gregg) Village	Excavated	R. E. Jensen	RBS-SI
	39HU223 (Fry) Village	Excavated	R. E. Jensen	RBS-SI
	39HU224 Village	Excavated	R. E. Jensen	RBS-SI
	39HU225 ?	Tested	R. E. Jensen	RBS-SI
	39HU231 ?	Tested	R. E. Jensen	RBS-SI
	39HU238 (Hawk) Village	Excavated	R. E. Jensen	RBS-SI
	39ST9 (La Roche) Village	Extensive excavation	R. E. Jensen, J. J. Hoffman	RBS-SI
	39ST232 (La Roche) Village	Extensive excavation	J. J. Hoffman	RBS-SI
	39ST56 (Sommers) Village	Test	J. J. Hoffman	RBS-SI
	39ST17 (Fort George) Village	Test	J. J. Hoffman	RBS-SI
	39HU60 (Grandle) Village	Test	W. J. Folan	RBS-SI
1964	39ST56 (Sommers) Village	Extensive excavation	R. E. Jensen	RBS-SI
	39ST17 (Fort George) Village	Extensive excavation	J. J. Hoffman	RBS-SI
	39HU60 (Chapelle Creek) (Grandle) Village	Extensive excavation	L. A. Brown	RBS-SI
	39ST218 Village	Extensive test	D. T. Jones	RBS-SI
	39ST219 Village	Extensive test	D. T. Jones	RBS-SI

Table L-1. A summary of Big Bend area fieldwork, 1956-1968 (concluded).

Year	Site	Nature of Work	Excavator	Institution
	39ST222 Village	Extensive test	D. T. Jones	RBS-SI
	39ST224 Village	Extensive test	D. T. Jones	RBS-SI
	39ST223 (Ketchen) Village	Extensive test	D. T. Jones	RBS-SI
	39ST220 Village	Extensive test	D. T. Jones	RBS-SI
1965	39ST56 (Sommers) Village	Extensive excavation	R. E. Jensen	RBS-SI
	39ST224 (Cattle Oiler) Village	Extensive excavation	D. E. Moerman, D. T. Jones	RBS-SI
	39HU7 (McClure) Village	Excavation	R. B. Johnston	RBS-SI
	39HU204 (Bowman) Village	Extensive excavation	R. B. Johnston	RBS-SI
	39HU5 (Mush Creek) Village	Extensive test	R. B. Johnston	RBS-SI
	39HU203 ?	Limited test	R. B. Johnston	RBS-SI
	39HU205 ?	Limited test	R. B. Johnston	RBS-SI
	39ST223 Village	Limited excavation	D. T. Jones	RBS-SI
1966	39ST238 (Durkin) Village	Extensive excavation	R. E. Jensen	RBS-SI
	39ST224 (Cattle Oiler) Village	Extensive excavation	D. T. Jones	RBS-SI
	39ST223 (Ketchen) Village	Excavation	D. T. Jones	RBS-SI
1967	39LM2 (Medicine Creek) Village	Extensive excavation	R. E. Jensen	RBS-SI
	39LM222 Village	Extensive excavation	R. E. Jensen	RBS-SI
1968	--Shoreline Survey--		Mallory	

a number (i.e., 39HU5, 39HU205) that originally were recommended for more extensive work. Of course changes of plan were inevitable. In Lyman County, the only site (39LM207) recommended for excavation was neither dug nor tested and there was yet another in Buffalo County (39BF223). In Hughes County the situation was quite different. Here, eighteen sites were to have been excavated but by the end of 1968, only six of them had been examined and of these, half were merely tested. The Hughes County sites were left until late in the program because most were in the upper end of the reservoir and were at higher elevations than those of the downstream counties. Thus they would be the last flooded if indeed some were flooded at all. By 1964, when work began in Hughes County, the relevant cultural complexes had come to be understood and it was not seen as advantageous merely to add to existing trait inventories. In addition, funds were limited and time was short so that a number of sites of known affinities and originally intended for more extensive work were just tested or neglected entirely. Still others (39HU222, 39HU223, 39HU238, etc.) were excavated even though not recommended because of a perceived need for data from poorly known areas.

Excavation and testing within the Big Bend Reservoir focused in relatively few locations: 1) Lower Brule, 2) Medicine Creek, 3) Fort George, 4) La Roche, 5) Fort Thompson, 6) the "Pocket" of the Bend, 7) Chapelle Creek, and 8) Medicine Knoll Creek. Major concentrations of sites in these areas apparently reflect a recurring physical (and ecological) pattern *viz* extensive areas of bottomland (MT1) overlooked by low terraces (MT2) with easy access to the grasslands above (MT3). It has been assumed that the "bottoms" provided cropland and were a source of food and material for construction. Villages invariably lay upon MT2, in open, insect free locations although sites diagnosed as camps might be found elsewhere as well.

Sub-regional concentrations of sites made it possible for the Smithsonian Institution to establish central field camps often shared by two or more parties. In some cases, personnel returned

year after year to the same location so that the region and the sites it held became intimately known. A few archeologists devoted lengthy periods of work to the reservoir, insuring the sort of continuity necessary for an on-going program. During 1957-1962, W. W. Caldwell, then of the SI, excavated in the Lower Brule and Medicine Creek areas. Richard E. Jensen spent five seasons in much the same area but with incursions upstream into the La Roche and Pocket localities. Others spent lesser periods in the Big Bend, particularly Carlyle Smith and G. Hubert Smith.

Fieldwork extended over the period of 1956-1968, beginning and ending with surveys. Except for the last two years, there were at least two field parties at work each summer, but almost always fewer than were active in the Oahe Reservoir during the same period. Resources were thinly spread and only the infusion of non-appropriated funds made it possible to complete the program in reasonable degree. In 1961 a National Science Foundation grant was received to support problem-oriented projects in both Big Bend and Oahe Reservoirs. Neuman's excavation at mound sites in the Fort Thompson area during 1961 (39BF225, 39BF223, and 39BF234) and Caldwell's work at Lower Brule during 1961 and 1962 (39LM208, 39LM209, 39LM232, etc.) were underwritten largely by these funds.

A terminal survey in 1968 brought fieldwork to an end. It was found that shoreline erosion was well advanced and a number of surviving sites were suffering badly. More important perhaps, no significant new sites were found.

THE RESULTS

Archeological concerns did not end with the flooding of the reservoir. Fieldwork was largely at an end, of course, but analysis and synthesis of the results have continued until the present. The administrators of the salvage program assumed that in the Big Bend, as elsewhere, nine months of laboratory analysis was sufficient to report the results of three months of intensive fieldwork. Even

AD-A148 782 ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BAN.. (U) NEBRASKA UNIV LINCOLN DIV OF ARCHEOLOGICAL RESEARCH C R FALK ET AL. APR 84 3/4

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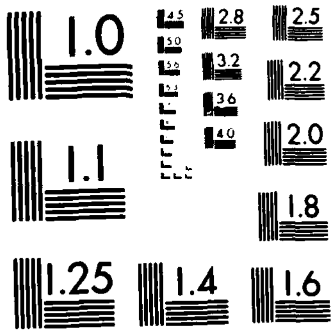

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

by 1956 it had become apparent that such a time table was no more than a pious hope. The complexities of a little-known prehistory and fluctuating construction schedules, forced an emphasis upon fieldwork and ultimately, a lag in publication. Turnover of personnel and the limited experience of many participants were complicating factors. An accumulating backlog of unpublished site collections thus was a persistent problem and a source of criticism among those outside the Smithsonian. The indictment was never entirely warranted. It is true that publication was hesitant at first and developed momentum slowly. Preliminary statements appeared annually in Archeological Progress Reports distributed by the Missouri Basin Project (and later, the River Basin Surveys) from 1956 onward. Similar statements, but perhaps somewhat more analytic, were published in the Proceedings of various Plains Conferences. By the beginning of the 1960s a scattering of papers was appearing (i.e., the Black Partizan Site: A Preliminary Analysis by W. W. Caldwell, Plains Anthropologist, Vol. 5, No. 10, 1960; the Truman Mound Site, Big Bend Reservoir Area, South Dakota by R. W. Neuman, American Antiquity, Vol. 26, No. 1, 1960). Others followed in respectable numbers including a few theoretical statements of extra-reservoir importance (The Dynamics of Stylistic Change in Arikara Ceramics by J. Deetz, Illinois Studies in Anthropology, No. 4, 1965; Horizon and Tradition in the Northern Plains by D. J. Lehmer and W. W. Caldwell, American Antiquity, Vol. 31, No. 4, 1966; The Bad River Phase by J. J. Hoffman and L. A. Brown, Plains Anthropologist, Vol. 12, No. 37, 1967). Beginning in 1966, more extensive reports began to appear as monographs, most of which contain highly synthetic statements of regional prehistory. A monograph series, Smithsonian Institution Publications in Salvage Archeology, was developed specifically to provide an outlet for such work.

Five issues are concerned with the Big Bend Reservoir:

- The Black Partizan Site by W. W. Caldwell, No. 2, 1966
- The Two Teeth Site by C. S. Smith and A. E. Johnson, No. 8, 1968
- Big Bend Historic Sites by G. H. Smith, No. 9, 1968
- The La Roche Site by J. J. Hoffman, No. 11, 1968
- The Grand Detour Phase by W. W. Caldwell and R. E. Jensen, No. 13, 1969

These constitute a mature statement of Big Bend prehistory within the broader context of the Middle Missouri. Many of the results are summarized in Middle Missouri Archeology by D. J. Lehmer, National Park Service, Department of the Interior, Anthropological Papers, No. 1, 1971. The record is not yet complete, however; monograph studies continue to appear, most recently The Talking Crow Site by C. S. Smith, University of Kansas Publications in Anthropology, 9, 1977, documenting fieldwork done in 1950-52. Still others are yet to come.

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VOLUME III
APPENDIX 1

ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

SECTION M

NOTES ON THE HISTORICAL CARTOGRAPHY OF THE LAKE SHARPE AREA, 1795-1892

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APPENDIX 1, SECTION M

NOTES ON THE HISTORICAL CARTOGRAPHY OF THE LAKE SHARPE AREA, 1795-1892

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INTRODUCTION

The Big Bend of the Missouri River--often called the "Grand Detour", as it is here--is a conspicuous and historically significant feature of the river in central South Dakota. It is not, however, to be confused with another "Big Bend" of the Missouri River, much further upstream, in what is now west central North Dakota, the term having also been applied to that part of the Missouri which was nearest the Souris River (Diller 1946:508,n16), where the Missouri turns south from its previously easterly course through present-day North Dakota, near where Garrison Dam stands today. To avoid confusion, we allude herein to the latter bend as the "Big Bend of the North" (a term not used, however, in the early literature).

Grand Detour, the "upper" or downstream part of a deeply intrenched S-shaped meander, is a landmark on maps of the Missouri River. Today, it forms the lower part of Lake Sharpe. The following study of the historical cartography of the Lake Sharpe area includes a consideration of that part of the Missouri valley--and its immediate environs--now inundated or otherwise affected by that lake between the Big Bend Dam and the highway bridge over the Missouri River between the towns of Pierre and Fort Pierre, South Dakota.

METHODS OF RESEARCH

All known maps made between 1795 and 1892, believed to be relevant to an understanding of the archeological and historical cultural resources of the Lake Sharpe area, were inspected. The date 1795 was chosen because there is no reliable information on any map prior to that date of any real significance to the study area; the date 1892 was chosen because after that date, information

on maps so proliferated that no general study could incorporate all the data available; it would be necessary to conduct detailed studies of small sectors of the reservoir area.

Whereas the concern here is to document those cultural resources shown on maps themselves, related documents were consulted and are cited to place those maps and the data on them in historical perspective. Two historical surveys were of particular value: those of Mattison (1962) and Smith (1968).

All regular sets of maps of the Missouri River (both primary and secondary, published and unpublished) were inspected, as well as more general maps deriving from atlases and other sources. It would be impossible to inspect all of them, so only those which provide information of relevance to the present study are cited herein. Table M-6 (following the text) lists sources for published versions of the maps discussed, and/or gives the locations of unpublished original manuscript maps. Photocopies of all maps cited are in the author's collection.

The Missouri River has long had a reputation for having a very changeable channel. The fact that its channel could shift from one side of the Missouri valley to the other overnight is all but legendary. This reputation for change has been somewhat exaggerated, however, for some parts of the Missouri valley seem to have remained relatively stable for the past century and a half. For example, most of the major islands shown on maps in the Lake Sharpe area, beginning with the maps of John Evans in 1796-1797, have modern counterparts. A few obviously do not.

The stability of these islands intimates that they may be bedrock controlled, or that some hydrological factor has acted to perpetuate many of these mid-channel features which, on the lower Missouri River (as in the state of Missouri) tend to be ephemeral. In any case, because there is such a close correspondence between many of the modern and the early islands in the Lake Sharpe area, I speak of certain early islands as being equivalent to modern ones, without implying that they are the identical islands represented earlier: for the moment, these correspondences should be regarded simply as analogs.

Two maps are provided with the text: (1) a map of the Grand Detour made by Antoine Soulard in 1805 from explorations made by John Evans in 1796-1797; and (2) a composite map, from many sources, synopsizing the data discussed in the text. The composite locates all major cultural resources in the reservoir shown on maps of the period 1795 to 1892, on both sides of the Missouri River, whether or not they actually remain above the level of Lake Sharpe (e.g., Fort au Cédar, Fort George). The composite map (Figure M-2) follows the text.

NOTE: The term "modern map" as used herein alludes to terms used on the United States Army Corps of Engineers map of the Missouri River from Gavins Point, South Dakota, to Stanton, North Dakota (1947 series), and cited in the text as "CEMOR 1947".

MAPS PREDATING THE LOUISIANA PURCHASE:

SPANISH ERA MAPS

SOULARD 1795

Maps of the Missouri River before 1795 show no real detail of the area which was to become Lake Sharpe. Maps of the river from its discovery in 1673 until 1795 either show its course downstream from Lake Sharpe, or they show the course of the upper Missouri in such a generalized manner that nothing can be identified with precision in the Lake Sharpe area.

Antoine Soulard, a French emigrant to St. Louis, was employed by the Spanish there as a cartographer in the 1790s and in the years before Lewis and Clark ascended the Missouri. Three copies are extant of a map he produced in 1795 of the upper Mississippi and of the Missouri River, one each in Spanish, French, and English. These maps have been the subject of a great deal of research (see, for example, Diller 1946:505-509; Diller 1955a; Diller 1955b; Wheat 1957:157-159; and Wood 1978:9-15). Since there is very

little difference between the three versions, at least for the Lake Sharpe area, we allude here only to the English version (Thwaites 1904-05 VIII:Map 3).

On this map the Grand Detour and the Big Bend of the North are combined into a single, greatly exaggerated feature (Diller 1946:508,n16). Above this bend the course of the Missouri is badly distorted and entirely speculative. The Missouri is generalized and speculative also in the area of Lake Sharpe. For example, "The Little Missouri R." (modern Bad River) is shown emptying into the Missouri just below "The Grand Detour"; the "Turtle Mts" are shown on its north side (Turtle Mountain is actually on the present North Dakota-Manitoba boundary); and the "Mandan Inds." are shown on the upstream end of the Grand Detour. None of these depictions, including the size and proportion of the Grand Detour itself, said on the map to have a distance of 20 miles across its gorge, are accurate.

The importance of the Grand Detour as a Missouri River landmark was, however, clearly established, and the map is a good expression of Spanish knowledge of this area as of 1795, the year before the Spanish were to explore and map the Missouri River as far upstream as the Mandan villages (Diller 1946:509). In spite of its inadequacies, parts of this map continued to be used until well after 1800, when much better information was available. The combined Grand Detour-Big Bend of the North, for example, figured in many later copies: for example, the Pitot (Lafon) 1802 1 and 2 (which Wheat 1957:249 calls the Mississippi 1802, 1 and 2); the 1804 Arrowsmith and Lewis; the 1810 Tardieu (Gass); and the 1812 Gass (Wheat 1957 1958: Maps 254, 255, 259, 300, and 308).

COLLOT 1796

In 1794, J. B. Truteau left St. Louis for the upper Missouri. He eventually reached the mouth of the Cheyenne River, returning to St. Louis in 1796 (Nasatir 1952I:87ff). Information he obtained on this expedition (together with material from the Soulard 1795 maps)

found its way onto a map of the Missouri River produced in 1796 by the French general, Victor Collot (Diller 1946:509).

This map, published in both French and English, shows the Grand Detour between the White and the "little Missouri" (or Bad) rivers, but depicts nothing else of significance on this part of the river other than the term "Rasade Bleue N." (N. Rafa de bleue" on the French edition), which is set between the middle reaches of the White and the Bad rivers. This is the "Blue-bead nation" noted by Collot in his "State of the Indian Nations" (Nasatir 1952II:384), and identified by Thwaites (1940-05I:190) as the Arapaho. Parenthetically, in Truteau's "Description of the Upper Missouri", he notes (Nasatir 1952II:378) that the river we now know as the Bad was called the "Little Missouri" by the French, but it was known to the "savages" as "Tranquil Water".

On this map, "The Grand Detour", as Diller notes, "is reduced nearly to its true proportions" (as opposed to that on the Soulard 1795), but is reversed in direction from what it is in fact. This seems, however, to have been Truteau's conception of it (Diller 1946:511,n24).

EVANS 1796 - 1797

As is usual for the course of the Missouri River in the present-day Dakotas, the first clear depiction of the area that is now Lake Sharpe appears on the map produced by John Evans in 1796-1797. A copy of this map, drawn to a scale of about 1 inch = 8 to 10 miles, shows a variety of items relevant to the reservoir area (Diller 1946:514-516; Thwaites 1940-05VIII: Maps 6 and 7; Wood 1978:15-23). Although William Clark and James Mackay are known to have made notations on other sheets of this set of maps (Wood 1978:19), all of the notations in the Lake Sharpe area appear to be in one hand, all of them in brown ink.

On Thwaites' Map 6, "Lower I" (modern Brule Island) is shown at the lower end of the Grand Detour, just below the designation

"Portage de Seaux". This latter term is not to be confused with the "Seaux pass", shown further downriver between the mouths of Crow and Wolf creeks, where the Sioux were accustomed to crossing the Missouri (Thwaites 1904-05I:156,n1). In the western part of "big bend" is "Solitary Island" (modern Jungle Island). Modern Medicine Creek, called "Tylers River", is just downstream from "half mast Island" (for which there is no modern analog). Modern Cedar Creek is shown but is not named; near its mouth were three islands called "3 Sister Islands"--modern Dores (or Dorion Island, Cedar Island, and an unnamed island). "Cabrie Island", which Lewis and Clark (Thwaites 1940-05I:151) called "Goat Island" (referring to the pronghorn antelope), was just below the mouth of modern Chapelle Creek, which the map does not name. The last upriver feature noted on this segment of the map is "I au Biche" (Elk Island), which was near the mouth of Medicine Knoll Creek (probably modern Fort George Island).

On Thwaites' Map 7 the first named feature is a stream entering the Missouri from the south called "R. au high Water", probably modern Antelope Creek. Just above it is "Long reach Island" (modern Farm Island). Evans' "good humor Island" (modern Leframboise Island) is just below the mouth of the "Little missurie" river, which Lewis and Clark (Thwaites 1904-05I:163) were to rename the Teton (modern Bad River). Except for Elk Island and Long Reach Island, in his journals Clark specifically says the features noted above were "called" by the above terms--almost certain evidence that he was closely following Evans' map, although some of the names were probably known to the French engagés employed by the expedition. It is unfortunate that the extant extracts from Evans' own journal (Quaife 1916; Nasatir 1952II:495-496) make no note of this part of the river.

MACKAY 1797

The so-called Mackay 1797 map, sometimes called the "Indian Office map", is apparently a copy of a map produced by James Mackay

in 1797. The author of this map is said to be known, but is awaiting publication (J. F. McDermott, personal communication, December 1978). Since Mackay himself is not known to have gone above the mouth of the Niobrara River, the course of the Missouri upstream from that point to the Mandans could only have come from Evans' explorations (Diller 1946:512-516; Diller 1955b; Wood 1978: 26-31). Because it is drawn to a much smaller scale, it shows much less detail than the Evans map.

The Mackay map shows, in both French and in English translation, the following features also shown on the Evans map: a "Sioux crossing" ("Portage des scous = The Sioux carrying place"); Brule Island ("I. au bas de grande dẽtour = Island below the big bend"); Medicine Creek ("R. du Vielle Langlois = old Englishmans Island"); Jungle Island ("I. solitaire = Solitary Island"); an island for which there is no modern analog a few miles above Medicine Creek ("I. au demi lune = half-moon Island"); three islands near the mouth of the unnamed Cedar Creek ("Les I. de 3 Sours = Islands of the three Sisters"); an island just below modern Chapelle Creek ("I. au Cabris = Goat Island"); Fort George Island ("I. au biche = Elk Island"); and Bad River ("R. petit Missouri - little Missouri River").

The river named "Vielle Langlois" alludes not to an "old Englishman", as the map states, but quite literally, to "old Langlois", a "member of a family of French extraction" (McDermott 1978:150). The words "M Louisells House in the Winter 1804 & 5" are inserted in Clark's hand, inverted, near modern Cedar Creek, but there is no site shown for the post, the location of which is discussed later in more detail.

Like the Evans 1796-1797, the Mackay 1797 is believed to have been carried upriver on the Lewis and Clark expedition, but it is obvious that Clark, in his field notes, depended more heavily on Evans' map, surely because of its greater detail.

SOULARD 1805

An interesting derivative of the Evans map is one made in St. Louis by Antoine Soulard, Surveyor General of Louisiana Territory, on 20 November 1805, to support the claim by Régis Loisel to a concession at Cedar Island (Diller 1946:514,n34). Soulard copies "the part of the course of the river Missouri. . .from a chart of the said river, which I have in my possession" (Abel 1939:229). This quotation implies the existence of yet another (and apparently lost) copy of an Evans or Mackay map. The map made by Soulard in 1805, in any case, does not appear to be a tracing of either the Evans or the Mackay maps already discussed. Unlike either of these maps, however, it shows a symbol for Loisel's Post: it is on the east, or left, bank of the river directly opposite the middle of the three islands labeled the "Isles aux Cèdres" (Fig. M-1).

Loisel had built the post for trade with the Indians in 1802-1803, on a large cedar-covered island near the mouth of present Cedar Creek (Abel 1939:26-27,229-230). It is mentioned in the journals of Lewis and Clark, and it was visited by and described in detail by Sgts. Gass and Ordway (Gass 1958:49; Quaife 1965:135). It was clearly built on one of the islands of the "Three Sisters", but its exact location is in doubt, in spite of a very careful search for it by G. Hubert Smith of the River Basin Surveys (Smith 1968:47-54).

This 1805 map by Soulard carries legends more elaborate than on the Evans and Mackay maps, as well as some information not shown on them. On the right bank of the Missouri, opposite "Lower Island", are seven triangular (tipi?) symbols, designated as "Villag & abord [landing] des Sioux". Medicine Creek is called "Rivière du Vieux Anglois" (Soulard has here transformed the family name "Langlois" into "Anglois", following Clark's improper identification on the Mackay 1797). Modern Medicine Knoll Creek (shown in the location of Chapelle Creek) is called by the French equivalent of its modern name, "River Côte de Médecine", or "River of the Medicine Bluff".

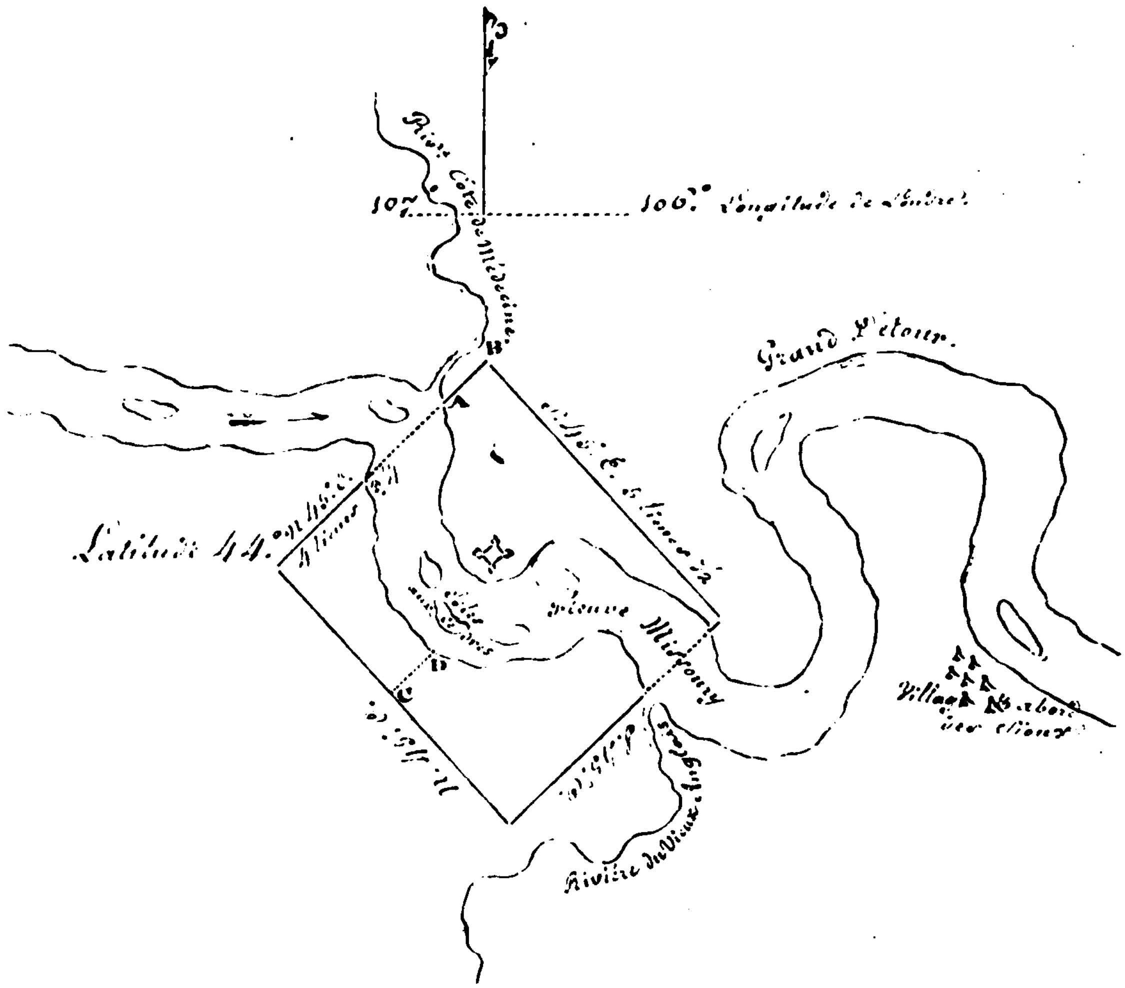


Figure M-1. Map of the Grand Detour area, prepared in 1805 by Antoine Soulard to support Loisel's concession at Cedar Island (depicted by the rectangle), and made from a map in Soulard's possession based on an Evans or Mackay map of 1796-1797 (From: Record Management and Archives Service, Jefferson City, Missouri: record book C of the first board [1805-1812] p. 173).

NICOLLET (EVANS/MACKAY) 1797

This copy of an Evans or Mackay map is in the Nicollet papers in the Library of Congress, Manuscripts Division (Diller 1946:513, n32; Wood 1978:32-33). There are only a few labels on this map above the mouth of White River: in fact, the map shows only two features of interest for the Lake Sharpe area. There is a triangular symbol on the right bank of the Missouri opposite "Lower Island", and there is the label "Village & abord [landing] des Scious" (the exact wording on the Soulard plat of 1805) marked by an "X" between the mouths of Crow and Wolf creeks, downstream from the Big Bend Dam.

Two adjoining rectangles, near the "Isles aux Cědres a Loisel, are also shown on this map in the same location as on the Soulard 1805 sketch, on the east bank of the Missouri. In spite of this cartographic information, no trace of Loisel's post has ever been found in this location. A River Basin Surveys field party found, in 1956, a rectangular earthen embankment (39HU215) in the NW 1/4 of the NW 1/4 of Section 10, Township 108 North, Range 75 West. However, neither investigation at the time, nor those by the University of Nebraska's survey team in 1978, found any evidence to support the contention that this site was that of an early fur trading establishment; rather, it is surely some sort of historic/ recent homestead.

OTHER DERIVATIVES OF THE EVANS/MACKAY MAPS

There are at least nine extant derivatives of the Evans and Mackay maps (Table M-1). Two of them (Nos. 3 and 8) are described above, and another (the Frazer 1807) is discussed in the next section of this paper. Information of all of them appear to be secondary to that on the Evans and Mackay maps themselves. There are numerous similarities between the Nicollet copy of the Evans/Mackay map,

Table M-1. Evans/Mackay maps and derivatives.

Map	Reference
1. Evans 1796-1797	Wheat 1957:161-163, 245; Map 240
2. Mackay 1797	Wheat 1957:161-164, 246; Map 242
3. Nicollet (Evans/Mackay 1797)	Diller 1946:514-515; not cited in Wheat
4. Anonymous French c. 1797	Wheat 1957:177-178, 246; Map 242
5. Pitot (Lafon) 1802, 1	Wheat 1957:165,249; Map 254
6. Pitot (Lafon) 1802, 2	Wheat 1957:165,249; Map 255
7. Du Lac 1802	Wheat 1957:164,249; Map 256
8. Soulard 1805	Diller 1946:513-514; not cited in Wheat
9. Frazer 1807	Wheat 1958:46-48, 208; Map 286
10. Anonymous Spanish c. 1800	Lowery 1912:442, No. 730
11. Pichardo 1811	Wheat 1957:138,253; Map 276

and the sketch which Soulard prepared in 1805, leading one to suspect that both maps derive from the chart which Soulard said he had in his possession (Abel 1939:229), and on which he based his map of the Grand Detour area.

MAPS DERIVING FROM THE LEWIS AND CLARK EXPEDITION

FRAZER 1807

A map prepared to accompany an account of one of the members of the Lewis and Clark expedition, by Robert Frazer, is now in the Library of Congress. The map has been published (in part), as far as I know, only by Wheat (1958:46-48, Map 286) and by Clarke (1970:205), although neither reproduction includes the Grand Detour area. The account it was to have accompanied has vanished, if it was in fact ever written. Although Frazer had little or no access to Clark's own maps prepared during the expedition, the Frazer map depicts the entire course of the expedition in detail, although it contains a variety of conspicuous errors.

Wheat (1958:46-47) believed that a French cartographer probably fashioned the map for Frazer, for the bulk of the legends on it are in French, "but no clue to the man's identity has been found". Our unknown cartographer, however, did not start afresh in constructing the map from whatever information Frazer provided him; on the contrary, my inspection of the map for this study revealed that the map is in fact based on the Evans/Mackay maps as far upstream as the Mandan villages, although some curious distortions are apparent. For example, above the mouth of the Big Sioux River, the entire course of the Missouri River to the Mandan villages is displaced at nearly a 45° angle to the southwest of its general course!

Internal evidence is clear that part of the map is based on the Mackay 1797 map, or a copy of it, not on the Evans 1796-1797 map itself. It may never be possible to identify the base map, since the map has been redrawn, apparently with new information from Frazer.

For example, the Frazer map omits the meander bend now known as Painted Woods Lake, North Dakota, which was cut off between the time Evans visited the area and the time of Lewis and Clark. The likelihood is very good, however, that the Frazer map was based either on the Du Lac copy or on the Nicollet copy of a Mackay map. A careful perusal of the map will demonstrate this, but two correspondences are cited to illustrate this: (a) the Frazer map carries the legend "much white bear" on the upper Niobrara, and "much Beaver" on the middle reaches of the Elkhorn River--legends patently derived from those which read "Dans cette partie il y a boucoup d'hors blancs" on the Du Lac 1802 map, and "Il y a beaucoup de Castors dans cette Rivière", on the Nicollet copy; (b) furthermore, the two lakes which provide the sources for Crow and Wolf creeks, above White River, South Dakota, appear only on the Du Lac and Nicollet copies and not on the Evans 1796-1797 nor on the Mackay 1797 maps.

Frazer lived in or near St. Louis from 1806, following the return of the expedition, until 1815 (Clarke 1970:61). Under these circumstances, it is possible that Frazer or his unknown cartographer obtained from Soulard himself charts or information, since Soulard also lived in St. Louis, and is known to have had a copy of an Evans or a Mackay map (see the above discussion of the 1805 Soulard map).

The part of the Frazer map which shows the Lake Sharpe area follows the Nicollet copy in showing a symbol for the "Scious" living near "Lower Island" (modern Brule Island). Above "The Great Bend", and opposite the center island of the Three Sisters ("I Céder au loisel") is a symbol for a fort. The rectangular symbol has bastion-like projections on each corner, precisely like the ones shown on the Soulard 1805 map, and is shown in the same location--on the east bank of the Missouri River. The last item relating to Lake Sharpe is Bad River, called "Coast physyc Riv.", a term not used elsewhere for this stream. One patent error on this part of the map is the fact that the words "old English. Riv." appear

between modern Crow and Wolf creeks, whereas on the Mackay 1797 and the Soulard 1805 maps, this term applies to modern Medicine Creek.

CLARK, SEPTEMBER 1804

There is a rough sketch of the Grand Detour in William Clark's field notes (Osgood 1964, Document 56:301), made beneath the entry for 21 September 1804. Lower Island and Solitary Island are shown, but are not labeled, the only term on the map being "Sand Salt" on the west edge of Grand Detour, a few miles above their camp for the night of 20 September. The significance of the label is not apparent from the journals published in Thwaites, but Ordway's journal (Quaife 1965:134) speaks of there being "Saltish Sand" along the river in this area.

CLARK [O'FALLON] 1804 ROUTE MAPS

A variety of features is shown on the maps produced by Clark during the passage of the expedition between 19 and 24 September, 1804, through the Lake Sharpe area. The maps Clark made for this part of the journey, like other route maps as far upriver as the Mandans, have been lost. Fortunately, they were copied by Major O'Fallon for Prince Maximilian's journey up the Missouri in 1833, and photocopies of them are now on display at the Joslyn Museum, Omaha (Thwaites 1906XXII:14-15,236,n172; and Wood 1978:50-52). Data appearing on this map are summarized below (Table M-2).

CLARK 1810 AND LEWIS AND CLARK 1814

A master map of what was to become all of western United States was completed by William Clark by 1810, and was the map which Samuel Lewis used to engrave the chart for the 1814 Biddle edition of the Lewis and Clark expedition (Wheat 1958:49-51, 56-59).

Table M-2. Lake Sharpe features shown on the 1804 Clark route map.

Modern Name	Bank	1804 Designation on Map
Soldier Creek [now beneath Big Bend Dam]	West	Elm Creek (named by William Clark, p. 157)[a]
Counselor Creek	West	Night Creek (named by William Clark, p. 157)
Unnamed creek	West	Lower Island Creek (but named "Prickley Pear Creek" by Clark in text, p. 157)
Brule Island	--	Unnamed (but called by its old name, "lower Island", in text, p. 157)
[term shown near Sec. 35, T108N, R73W]	East	Red Paint
Grand Detour	--	Big Bend or Grand De Tortu [Detour]
Jungle Island	--	Unnamed (but called by its old name, "Solitary Island", in text, p. 158)
Medicine Creek	West	Tylors River, on which Lewis and Clark killed the first turkey seen on their route to the Pacific (see p. 159)[b]
[term shown near Sec. 20, T108N, R74W]	East	mock island (see p. 159)
Cedar Creek	West	Three Sisters Creek (see p. 160)
Dores (Dorion) Island	--	Cedar Island. Mr. Louiselles establishment in 1803 and 1804 to trade with the Lower Tetons a band of Sous (see p. 160); Maximilian penciled in a rectangle on the west central part of the island to show Loisel's Post
Unnamed island	--	Goat Island (see p. 161)
Chapelle Creek	East	Smoke [Creek]. (New name, due to the sighting of much smoke to the southwest, p. 160)

Table M-2. Lake Sharpe features shown on the 1804 Clark route maps (concluded).

Modern Name	Bank	1804 Designation on Map
Fort George Island	--	Elk I (p. 161; Maximilian penciled in "Simoneau's Island")[c]
Medicine Knoll Creek	East	Rubins Creek (new name, after Reuben Fields, p. 162)
Farm Island	--	Horse Island (new name not mentioned in text; Maximilian penciled in "Roy's Isl.")[d]
Leframboise Island	--	Bad Humoured Island (but called "Good humered Isld" in text, p. 163)[e]
Bad River	West	Teton River. Councelled with the Indians here (the expedition renamed the river after the Indians living nearby)

[a]Page references are to Thwaites 1904-05, Vol. 1.

[b]"Tyler" or "Tylor's" identity is unknown; since the name appears on Evans' map, the ascription is an old one. Clark later called this stream "Turkey River".

[c]"Simoneau" has not been identified, but the island bore his name in the 1840s, and was the locale for several independent traders (Sunder 1965:57,69).

[d]"Roy has not been identified, but may have been Jean Baptiste Roy, a trader on the Missouri River about this time.

[e]Leframboise Island is clearly called "good humor Island" on Evans' map; is just as clearly called "Bad humered Isld" on the 1804 route map. Yet Clark is specific in saying (p. 165) that the expedition "proceeded on about 1 Mile [above Bad River] & anchored out off a Willow Island [which] I call ... bad humered Island as we were in a bad humer" [following a disagreeable meeting with the Indians at the mouth of Bad River]. This implies that the term "Bad humer" was intended to be applied to this willow island (modern "Willow Island", or perhaps "Marion" or "Teton Island" (not shown on the route map) above Bad River-- and not to the large island at the mouth of the Bad which has come to be known as Leframboise Island.

The Clark 1810 manuscript map has been published in facsimile form several times (Wheat 1958, Map 291; Yale University Library 1950), and the engraved version (Wheat 1958, Map 316) many times. The 1814 engraved map shows all of the following features (except "Ceder I") which appear on the 1810 manuscript map: "Grand Detour", "Turkey R" (modern Medicine Creek), "Ceder I", "Smoke Cr" (modern Chapelle Creek), "Scious (or Sioux) Camp"; and "Teton River" (modern Bad River).

Unlike the manuscript map, the 1814 engraved version has "Tetons of the Burnt-Wood, a band of the Sioux 1500 Souls", written across the gorge and main body of the Grand Detour. This map was copied extensively for the next half century and, according to Wheat (1958:58), was "one of the most influential ever drawn, its imprint still to be seen on maps of Western America".

MAPS FROM LEWIS AND CLARK TO THE FEDERAL LAND OFFICE MAPS

NICOLLET 1839 AND NICOLLET 1843

Joseph N. Nicollet made an expedition up the Missouri River in the Spring of 1839 on the steamboat Antelope (Bray and Bray 1976:25-33, 135-169). He was accompanied on this expedition by John Fremont, who was to become famous for his own maps a little later. Nicollet produced a map of the Missouri River from the Gasconade River, in Missouri, to Fort Pierre, in 64 sheets, at a scale of about 1.75 miles per inch.

The Antelope traversed the area which was to become Lake Sharpe between 8 and 12 June, 1839, the boat being delayed by low water that spring. These maps, now in the Nicollet Collection in the Library of Congress, Manuscript Division, provided the basis for part of Nicollet's engraved, landmark map of 1843, the

"Hydrographical Basin of the Upper Mississippi River", although there are minor variations in detail, largely due to the reduced scale of the engraved edition (1 inch = 20 miles). Table M-3 provides a concordance of these two maps, in addition to providing translations, provided by Dr. Richard Carter, of some of the Dakota terms which appear on both maps.

The map on page 413 of the manuscript Nicollet chart shows the Missouri Fur Company's "Fort au Cèdre" a mile or so above the mouth of modern American Crow Creek, on the west bank, and opposite the downstream end of what he called "2d Cedar Isld". This site is also shown on this 1843 engraved map, which shows "Old Ft. Aux Cèdres" in the same location. This Missouri Fur Company post should not be confused with Loisel's post of the same name.

In their detailed study and translation of Nicollet's journals, Bray and Bray (1976:30) comment that

> Like Maximilian six years earlier, he apparently had with him a copy of the Lewis and Clark map, for his journal frequently refers to details of the river's course and embankments as recorded by these explorers, details which could not have otherwise been available to him.

Since in his journal and maps (Bray and Bray 1976:147,154-158; and the charts on sheets 375 and 396 of his Missouri River map, in the Library of Congress), Nicollet alludes to "Lewis and Clark", and never to Gass, for instance, it is probable that he had an 1814 Biddle edition of the expedition journals with him. There is no evidence that he had any copy of a Lewis and Clark map other than the one (the Lewis and Clark 1814, 1) which was engraved from Clark's 1810 manuscript map.

It is of course possible that Nicollet carried the copy of the Evans/Mackay map found in his collections at the Library of Congress with him. That it figured in at least a minor way in his 1839 Missouri River manuscript map is demonstrated by the fact that both the Missouri River manuscript map and the 1843 engraved edition show the courses of Crow and Wolf creeks identical to those shown on the Nicollet (Evans/Mackay) 1797 map, including the lakes which were depicted as their sources, and which do not exist.

Table M-3. Place names on the Nicollet 1839 and 1843 maps[a].

Modern Name	1839 map	1843 map	Translation and Comment
Brule Island	Lower Island	Lower I.	
Grand Detour	--	Karmichigan Bend	
Chaney Rush Creek	Wasag oyukse Wekpa	Wasag C.	[wasag- oyukse wakpa], "broken arrow-shafts creek"
Medicine Creek	Medicine River	Pahah Wakan, or Medicine Hillock R.	
Joe Creek	Chan Shacha Oju Wakpa: La riviér du désert au boise See	Dry Wood Creek	[c^{h}a-sica- ozu wakpa], "grove"
Cedar Creek	Cedar Island River	3^d. Cedar Id. R	
Dores (Dorion) Island	Cedar Island	3^d. Cedar I	
Cow Creek area	Baie de Naples [bend]	Bai de Naples [Creek]	
Chapelle Creek	Riv. la Chapelle	Owawichah R.	
Medicine Knoll Creek	Medicine Riv.	Wiyo Pahah Wakan, or E. Medicine Knoll R.	

[a]Dakota place name translations provided by Dr. Richard Carter.

Table M-3. Place names on the Nicollet 1839 and 1843 maps[a] (concluded).

Modern Name	1839 map	1843 map	Translation and Comment
Antelope Creek	Riv. au Cabris	Katota tokah, or Cabri R.	
Mush Creek	Padanitoyohe Wakpaui, Riv. du ville des Riccaras abandonée	Padani Tiyohe, or Pawnis Deserted R.	[padani-t^{h}iyohe wakpa], "abandoned Arikara village creek
Bad River	Watha Shicha, or Teton River	Shichah or Bad R. (Titon R.)	[wakpa sica], "bad river"

[a]Dakota place name translations provided by Dr. Richard Carter.

WARREN 1856

The general map compiled by Lt. G. K. Warren in 1857 (1960: 84-91, Map 936) was based in part on his own explorations in 1855, when he explored the vicinity of Fort Pierre and to the west and southwest; and in 1856, when he mapped the Missouri River from the mouth of the Big Nemaha River (in what is now southeastern Nebraska) to the mouth of Big Muddy River, 60 miles above Fort Union (Warren 1859:90).

Warren passed through the Lake Sharpe area on a steamboat between 22 and 23 May, 1956, and recorded that area on Sheets 17 and 18 of his sketch map of the river. He was obviously familiar with the Nicollet 1843 map (if not with his 1839 sketch maps), for Warren, too, marked the Missouri Fur Company's "old Ft. Aux Cēdres" on his Sheet 16 a mile or so above the mouth of American Crow Creek; and, as on the Nicollet 1843, he notes, among other names now familiar, "3d Cedar Id R.", "Baie de Naples Cr", "Pawnees deserted R.", and "Teton or Bad R.". He shows two items of interest that are not on either of the Nicollet maps: some symbols for buildings on Farm Island, and several (tipi?) symbols and the word "Herders" at a location estimated to be in Section 13, Township 110 North, Range 78 West, on the east bank of the Missouri just below the mouth of modern Antelope Creek. The name Farm Island derives from its use as a farm by Upper Missouri Outfit personnel at Fort Pierre (Mattison 1962:268).

The French derivation of the name for Chaney Rush Creek is explained for the first time on two of Warren's other maps, filed with his Missouri River maps in the National Archives (Record Group 77, Q579). On a map entitled "Reconnaissances in the Dakota Country" (1855), and on another entitled "Explorations in Nebraska and Minnesota" (1857), this stream is called "Rock Bar Creek, or Chaîne de Roche Cr.".

HOWELL 1867

Major C. W. Howell left Sioux City aboard the steamboat *Miner* on 12 July 1867, to prepare a map of the Missouri River (Howell 1908; Wood 1978:69). His "Sketch of the Missouri River from the mouth of the Platte to Fort Benton" shows the Lake Sharpe area on Sheets 6 and 7. These maps, never published, are in the National Archives (Record Group 77, Q137).

Among the more conspicuous features of this map are the large numbers of wood yards shown: nine of them, on both sides of the river and one on Farm Island, between Fort Thompson and the mouth of Bad River. Two of them, both in Grand Detour, are named. One, on the west bank near the west end of the loop, was "Cadotte's Wood Yard". The other, on the east bank of the river below modern Jungle Island, was "St. John's Wood Yard". Table M-4 gives a concordance of other terms on the map.

MISSOURI RIVER COMMISSION 1890 AND MISSOURI RIVER SURVEY 1892

These two map series, the last we shall formally consider in this study, are the first published "modern" maps of the Missouri River to show the Lake Sharpe area. This area is shown on Sheets 38 to 40 of the MRC 1890 maps, and on Sheets 151 and 152 of the MRS 1892 series.

Because the information shown on these, and later maps, is so abundant, we here devote attention primarily to the east bank of the river, although major historic locales (Fort George, for instance) are discussed which were on the west bank. Data recorded in Table M-5 for these maps are given using modern (1947 CEMOR) legal descriptions as closely as could be judged. The Big Bend Dam itself covers the lower reaches of Soldier Creek and Badger Creek, and overlies the dwellings and fields of George Debaulies, Frank Pamani, and Miss Goodroad. Because the MRS 1892 maps were

Table M-4. Lake Sharpe features shown on the 1867 Howell map.

Modern Name	Howell 1867	Comment
Chaney Rush Creek	Rock Bar Creek	
Medicine Creek	Medicine River	
Dores (Dorion) Island	Spar Island	
Chapelle Creek	Capelle Cr.	
Stream identity uncertain	Little Medicine Creek (stream is mis-identified)	First use of the diminutive for this stream
Medicine Knoll Creek	Wiyo Paha Wakan R	Term derives from the Nicollet 1843 map
Fort George (39ST202)	Site of old Fort George	
Mush Creek	Pawnees Desert River	Term derives from the Nicollet 1843 map
Farm Island	Farm Island	
Fort Sully	Site of old Fort Sully	
Bad River	Bad R	

Table M-5. Place names on the Missouri River Survey 1892 map.

Modern Name[a]	Legend on Map[b]	Legal Description
	George Banks place	SE/NW/SW 16, 107-72
	Little Elk place	NE/NE/SE 17, 107-72
	Adam Red Dog place	NE/SW/NE 17, 107-72
	White Dog place	NW/SE/NW 17, 107-72
	Smith Bear place	SW/NW/NW 17, 107-72
	Two Teeth place	NW/NE/NE 18, 107-72
	Bear [Bare] Foot place	SW/SE/SW 7, 107-72
	Big Hand place	NE/SW/SW 7, 107-72
	Medicine Crow place	SW/SE/NW 7, 107-72
	William Slow place	NE/NE/NE SE/SE/NE 12, 107-73
	White Buffalo Walker place	SW/SE/SE 1, 107-73
All Saints Church	All Saints Church	NE/NE/SE 1, 107-73
	Unnamed place	SE/NE/SW 1, 107-73
	Joseph Standing Bull place	SE/NE/NW 1, 107-73
	Charging Hog place	SW/NE/NW 1, 107-72
	Bare Goose place	NE/NE/SE 35, 108-73
	Tight Head place	SW/NE/NE 35, 108-73
	Butcher place	SW/SE/SE 26, 108-73
	Unnamed place	SE/NE/SE 26, 108-73
Skunk Island	Cadotte Island	
Chaney Rush Creek	Chain of Rocks	"Rock bar" extends into Missouri River at creek mouth[c]
Jungle Island	St. Johns [or Cul de Sac] Isl.	
	Delay Whiteman place	SW/SW/SE 3, 108-74
	St. John place*	NE/SE/NW 10, 108-74

Table M-5. Place names on the Missouri River Survey 1892 map (continued).

Modern Name[a]	Legend on Map[b]	Legal Description
	Annie Demon place	SE/SE/NE 10, 108-74
	Chief Eagle place	SE/SW/SW 13, 108-74
	Medicine Isl.*	
Red Cloud Agency (39LM247)	Site of Old Red Cloud Agency	Center near: SE/SE/NW 3, 107-74
Fort Bouis-Defiance	Site of Old Fort Defiance[d]	Center near: SE/SW/SW 34, 108-74
[Mound near site 39LM1]	Large Indian Mound	NW/NE/NE 4, 107-74
Site 39LM226	Site of Old Indian village	
	Reynolds Ranch*	E½/NE 24, 108-75
Joe Creek	Reynolds Cr*	
	Cedar Isl. or Dorion Isl. No. 1*[e]	
	Dorion Island [No. 2]	
	Amos Shear place	SW/SW/NE 1, 108-76
	Feather Hawk place	NE/SE/SW 36, 109-76
La Roche Creek	Loiselle Creek	
Unnamed Cemetery	Cem.	SE/NW/NE 1, 109-76
	De Gray P.O.	NE/SW/NW 1, 109-76
	W. S. Harvey place	NW/SE/SW 3, 109-76
	Z. T. Thompson place	SW/NW/SW 3, 109-76
	W. S. Thompson place	SE/NE/SE 4, 109-76
	James Ackerman place	NE/SE/NW 5, 109-76
Fort George (39ST202)	Site of Old Fort George	NW/SW/SW 36, 109-77
	Chas. Pescha place	SE/SW/NE 22, 109-77
	Rousseau Station	SW/NW/NE 22, 109-77
	R. Rousseau place	SE/NW/NW 22, 109-77

Table M-5. Place names on the Missouri River Survey 1892 map (concluded).

Modern Name[a]	Legend on Map[b]	Legal Description
	Cem.	NW/NE/NW 22, 109-77
	M. C. Rousseau place	SE/SW/SW 15, 109-77
Cattle Oiler (39ST224)	Ancient Indian Village	NW/NE/NE 19, 4-34
Site 39ST235	Ancient Indian Village	C. NE¼ 13, 4-33
	School House	NE/NE/NE 15, 110-78
	Joseph Chaussee place	SE/SE/SE 9, 110-78
Farm Island	Farm Island	
Fort Sully	[unnamed church and cemetery]	NE/NE/SW 12, 110-78
Pierre Indian School	U. S. Indian Industrial School	N½/NW/NE 10, 110-78
Leframboise Island	Leframboise Island	
Bad River	Bad River	

[a]Terms underscored are on the west bank of Lake Sharpe.

[b]Asterisks denote that terms appear only on the MRC 1890 map.

[c]On the MRC 1890 map, the point of land on the south side of Chaney Rush Creek is labeled "Black Point", and the words "Indian Shacks" are on the west side of the stream, on or near site 39HU230 (see also Mattison 1962:254).

[d]See Smith (1968:33) for a discussion of this site.

[e]On the downstream side of this island, and facing the east bank, is a symbol labeled "Site of Ft. au Cédras".

drawn to the same scale as the CEMOR 1947, it was usually a simple and accurate matter to translate the early locations into modern legal descriptions.

FEDERAL LAND OFFICE MAPS

The entire area along the Missouri River between the Big Bend Dam and the present towns of Pierre and Fort Pierre were mapped by contractors for the Surveyor General's Office between 1874 and 1901, and appear on 22 separate sheets. They are on file in Pierre, South Dakota. Although they are invaluable sources for environmental studies, and studies of channel changes and related phenomena of the river itself, the maps contain nothing of direct relevance to the present study.

FORT AU CÉDAR

To summarize the cartographic data for Loisel's Fort au Cédar: (1) It is properly shown on an island by a penciled notation on one of the sheets of Maximilian's copy of the 1804 Clark route map, and on Sheet 39 of the Missouri River Commission 1890 series. Both maps show a location on the uppermost (upstream) island of the chain of the "Three Sisters". Both locations, however, were based on hearsay evidence. (2) Three maps show the post on the east bank of the Missouri River, in each case opposite the middle island of the "Three Sisters" (on the 1805 Soulard copy of an Evans/Mackay map, on the Nicollet (Evans/Mackay) 1797 map, and on the Frazer 1807 map, also a copy of an Evans/Mackay chart).

Several maps, beginning with the Nicollet 1839 charts of the Missouri River, and continuing with his 1843 engraved version, as well as the Warren 1956 map of the Missouri River and its derivatives locate "Fort au Cedres", a post of the Missouri Fur Company, on the west bank of the Missouri (Coves 1905) just above the mouth of American Crow

Creek, well below the location of Loisel's post in the Grand Detour area. The two posts have the same name, and is a possible source of confusion.

In brief: the original location of the post on one of the Three Sisters islands was never found. It is possible that the location on the east bank of the Missouri River may be related to site 39HU215, discovered by River Basin Surveys crews, but there is no evidence to support this hypothesis.

CONCLUSIONS

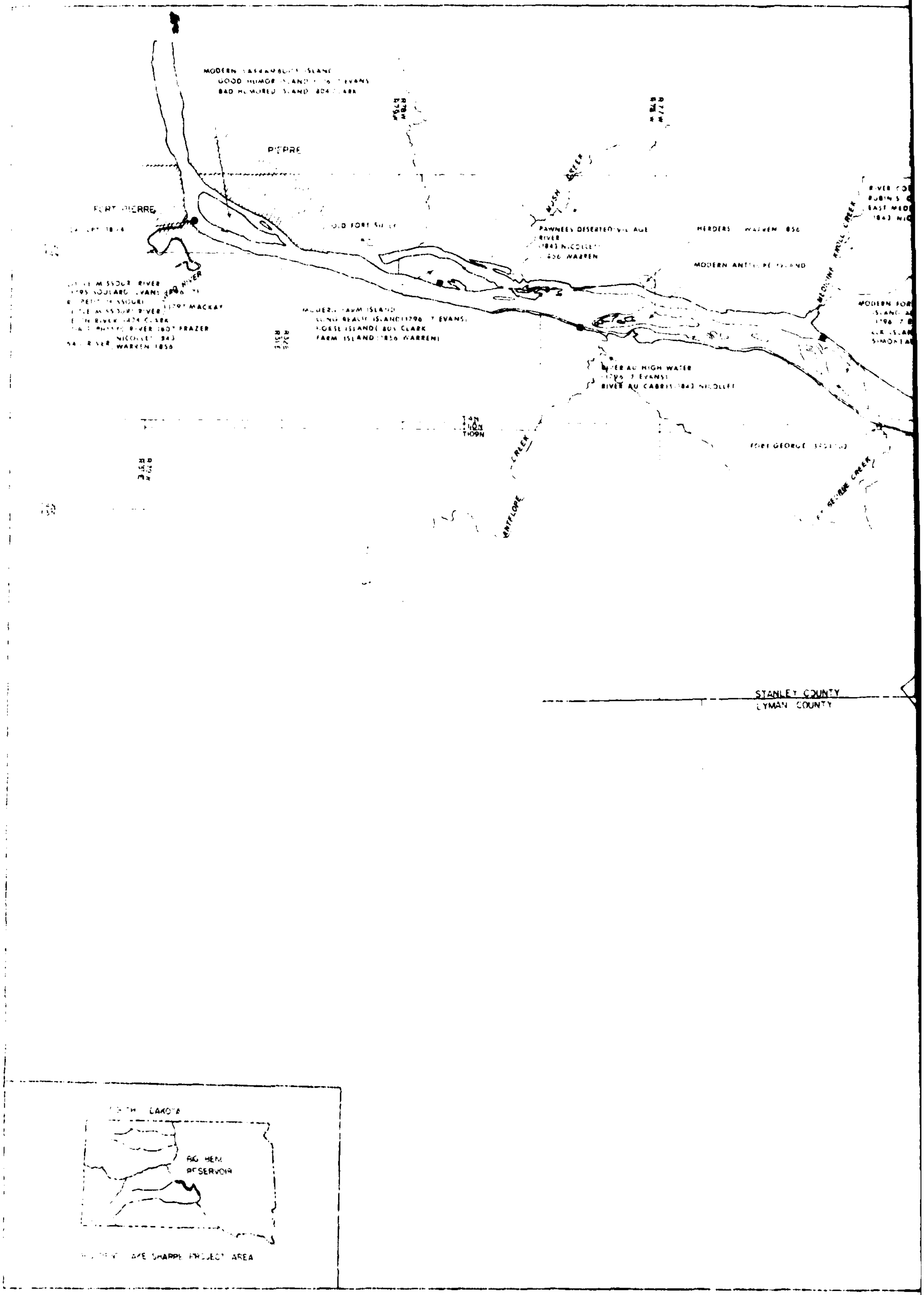
Cartographic data from maps dating between 1795 and 1892 have been reviewed above, and offer information relevant to the cultural resources of the Lake Sharpe area. Most of the early historic structures of the fur-trade era predating the advent of Euro-American settlement are now below the level of Lake Sharpe, and no resolution can be offered from cartographic data relating to the location of Loisel's Post. Probably the most relevant data are on the Missouri River Commission and the Missouri River Survey maps of 1890 and 1892, which show the first Euro-American and Indian settlements in "modern" structures along the river--an invaluable source for settlement studies and for early historic archeology.

Table M-6. Selected sources for maps cited in the text.

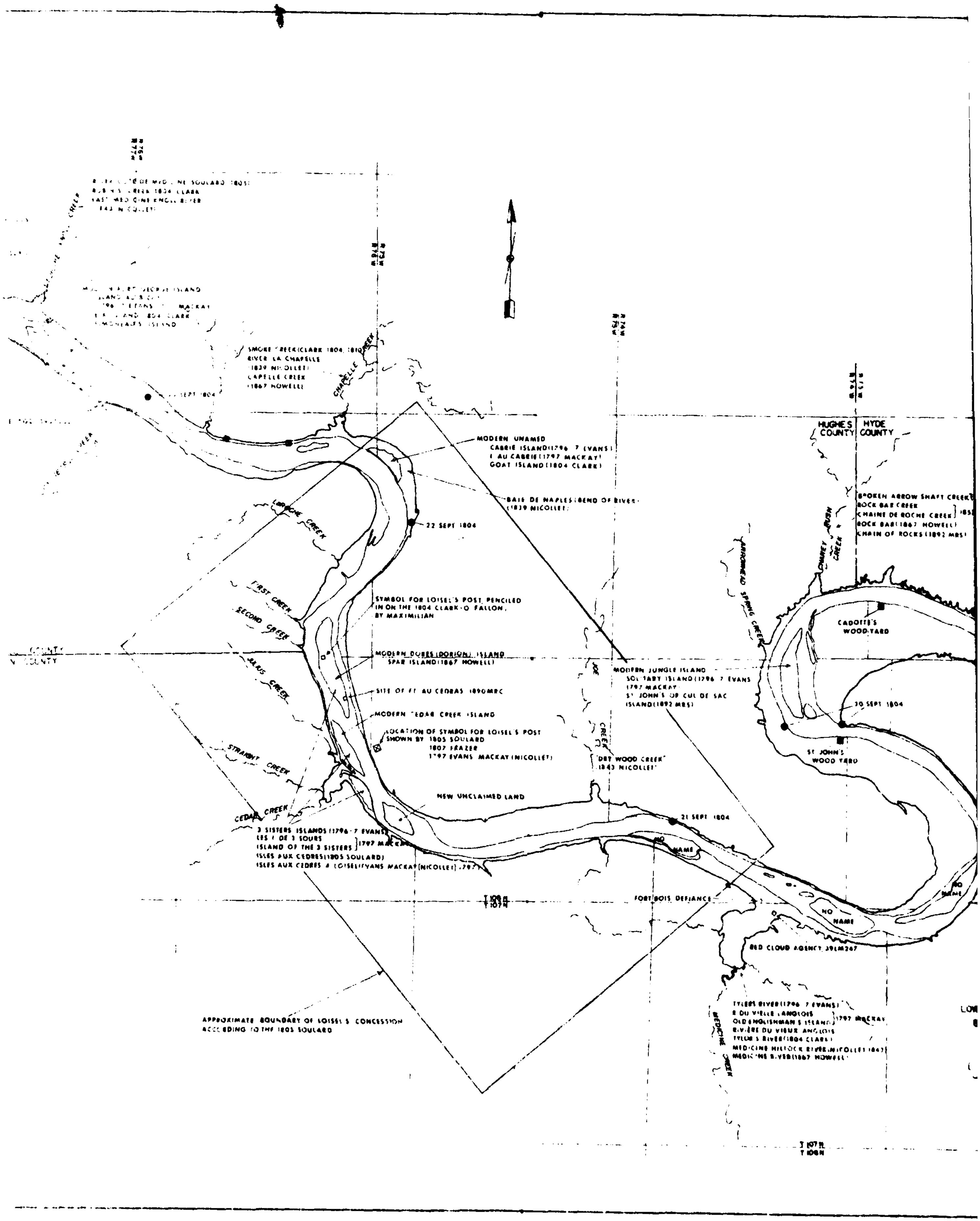
Map	Source
1. Soulard 1795, 1 (French version)	Diller 1955a: p. 175 Nasatir 1952I: p. 46 Temple 1975: Map 77
2. Soulard 1795, 2 (English version)	Allen 1975: Fig. 25 Thwaites 1904-1905VIII: Map 2
3. Soulard 1795, 3 (Spanish version)	Wheat 1957: Map 235a
4. Collot 1796	Collot 1826, 1924: Pl. 29 Nasatir 1952I: p 78 Wedel 1936: Map 6 Wheat 1957: Map 236
5. Evans 1796-1797	Thwaites 1904-1905VIII: Maps 6-7
6. Mackay 1797	Abel 1916: Pl. 2
7. Nicollet (Evans/Mackay) 1797	Unpublished: Library of Congress
8. Anonymous French c. 1797	Wheat 1957: Map 243
9. *Anonymous Spanish c. 1800*	Unpublished: see Lowery 1912:442, No. 730
10. Du Lac 1802	Beauregard 1916: p. 18 South Dakota Department of History 1914 Wedel 1936: Map 7 Wheat 1957: Map 256
11. Pitot (Lafon) 1802, 1	Wheat 1957: Map 254 (see Le Gardeur and Pitot 1969:84-85)
12. Pitot (Lafon) 1802, 2	Wheat 1957: Map 255 (see Le Gardeur and Pitot 1969:84-85)
13. Clark, September 1804	Osgood 1964: p. 301
14. Clark [O'Fallon] 1804 Route Maps	Unpublished: on display, Joslyn Museum, Omaha
15. Arrowsmith and Lewis (1804)	Arrowsmith and Lewis 1804: No. 55 Paullin and Wright 1932: Pl. 28 Wheat 1957: Map 259

Table M-6. Selected sources for maps cited in the text (concluded).

Map	Source
16. Soulard 1805	Diller 1946: p. 515
17. Frazer 1807	Clarke 1970: p. 205 Wheat 1958: Map 286
18. Clark 1810	Johnson 1974: pp. 218-219, 226-227, 242-245 Wheat 1957: Map 291 Yale University Library 1950
19. Tardieu (Gass) 1810	Wheat 1958: Map 300
20. Pichardo 1811	Unpublished: see Wheat 1958: Map 276
21. Gass 1812	Gass 1812 (see Wheat 1958: Map 308)
22. Lewis and Clark 1814, 1	Allen 1975: Fig. 45 Biddle 1814II: frontispiece Coues 1893IV: pocket Coues 1965 Paullin and Wright 1932: Pl. 32A Wheat 1958: Map 316
23. Nicollet 1839	Unpublished map of the Missouri River in the National Archives
24. Nicollet 1843	Nicollet 1843 Minnesota Historical Society 1976
25. Warren 1856	Unpublished map of the Missouri River in the National Archives
26. Warren 1857, 1	(see Wheat 1960: Map 936)
27. Howell 1867	Unpublished map of the Missouri River in the National Archives
28. Missouri River Commission 1890	National Archives
29. Missouri River Survey 1892	National Archives
30. Corps of Engineers, Missouri River (CEMOR 1947)	Omaha District, U. S. Army Corps of Engineers



PIERRE
FORT PIERRE
MODERN ANTELOPE ISLAND
RIVER AU HIGH WATER
RIVER AU CABRIS 1843 NICOLLET
FORT GEORGE
ANTELOPE CREEK
STANLEY COUNTY
LYMAN COUNTY
BIG BEND RESERVOIR
LAKE SHARPE PROJECT AREA


SMOKE CREEK(CLARK 1804, 1810)
RIVER LA CHAPELLE
1839 NICOLLET)
CAPELLE CREEK
1867 HOWELL)
CHAPELLE CREEK
MODERN UNAMED
CABRIE ISLAND(1796 7 EVANS)
I AU CABRIE(1797 MACKAY)
GOAT ISLAND(1804 CLARK)
BAIE DE NAPLES(BEND OF RIVER)
(1839 NICOLLET)
22 SEPT 1804
LAROCHE CREEK
FIRST CREEK
SECOND CREEK
SYMBOL FOR LOISEL'S POST PENCILED
IN ON THE 1804 CLARK-O FALLON,
BY MAXIMILIAN
MODERN DOBES (DORION) ISLAND
SPAR ISLAND(1867 HOWELL)
SITE OF FT AU CEDRAS 1890MRC
MODERN CEDAR CREEK ISLAND
LOCATION OF SYMBOL FOR LOISEL'S POST
SHOWN BY 1805 SOULARD
1807 FRAZER
1797 EVANS MACKAY(NICOLLET)
STRAIGHT CREEK
CEDAR CREEK
NEW UNCLAIMED LAND
3 SISTERS ISLANDS (1796-7 EVANS)
LES I DE 3 SOURS
ISLAND OF THE 3 SISTERS
ISLES AUX CEDRES(1805 SOULARD)
ISLES AUX CEDRES A LOISEL(EVANS MACKAY(NICOLLET) 1797)
1797 MACKAY
21 SEPT 1804
NO NAME
FORT BOIS DEFIANCE
T 108 N
T 107 N
APPROXIMATE BOUNDARY OF LOISEL'S CONCESSION
ACCORDING TO THE 1805 SOULARD
MODERN JUNGLE ISLAND
SOLITARY ISLAND(1796 7 EVANS
1797 MACKAY
ST JOHN'S OR CUL DE SAC
ISLAND(1892 MRS)
DRY WOOD CREEK
1843 NICOLLET
JOE CREEK
HUGHES COUNTY
HYDE COUNTY
BROKEN ARROW SHAFT CREEK
ROCK BAR CREEK
CHAINE DE ROCHE CREEK
ROCK BAR(1867 HOWELL)
CHAIN OF ROCKS(1892 MRS)
ARROWHEAD SPRING CREEK
CHIMNEY RUSH CREEK
CADOTTE'S WOOD YARD
20 SEPT 1804
ST JOHN'S WOOD YARD
RED CLOUD AGENCY 39LM247
TYLERS RIVER(1796 7 EVANS)
R DU VIELLE ANGLOIS
OLD ENGLISHMAN'S ISLAND
RIVIERE DU VIEUX ANGLOIS
TYLOR'S RIVER(1804 CLARK)
MEDICINE HILLOCK RIVER(NICOLLET 1843)
MEDICINE RIVER(1867 HOWELL)
1797 MACKAY
MEDICINE CREEK
T 107 N
T 106 N

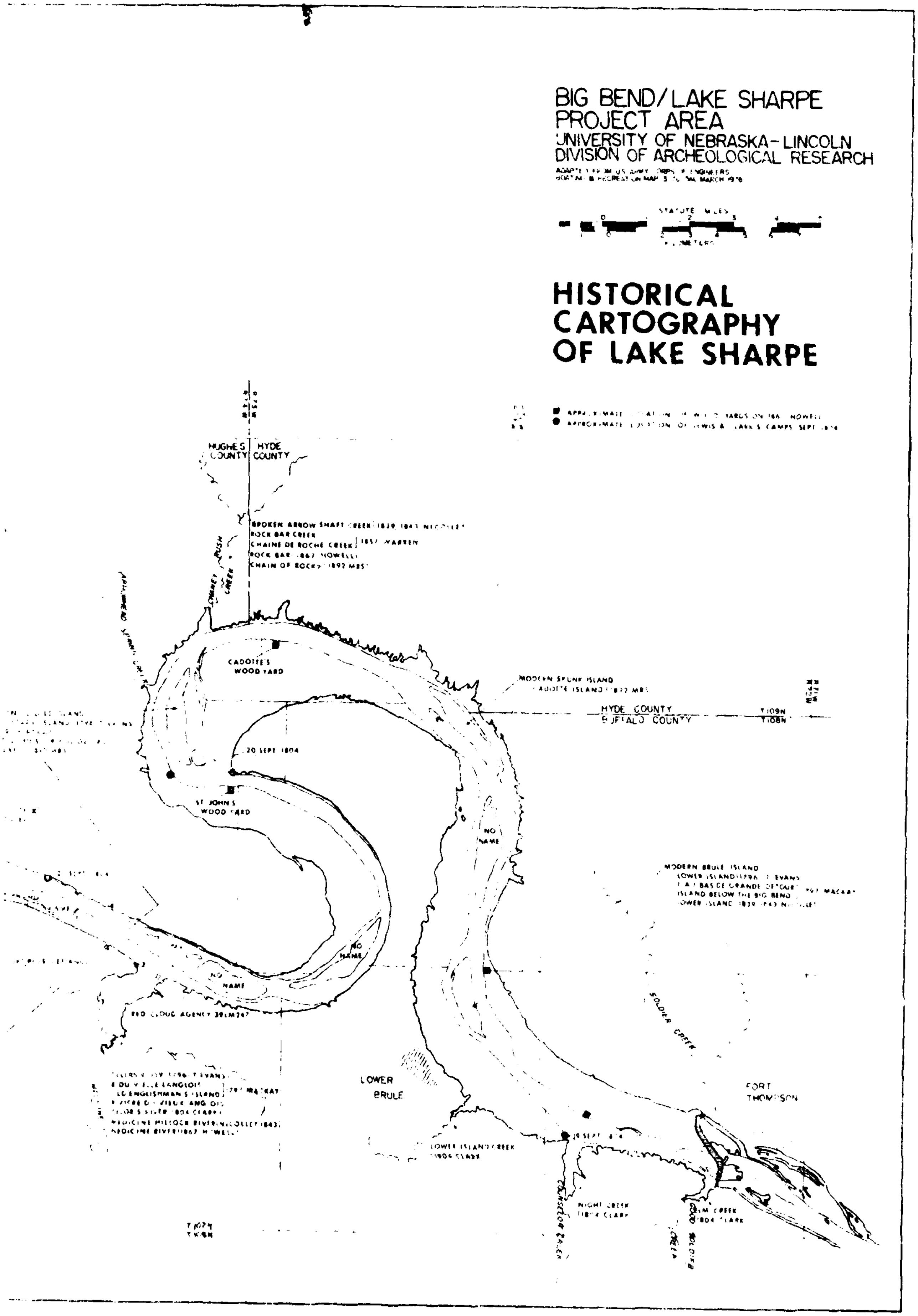

BIG BEND/LAKE SHARPE
PROJECT AREA
UNIVERSITY OF NEBRASKA-LINCOLN
DIVISION OF ARCHEOLOGICAL RESEARCH
STATUTE MILES
HISTORICAL
CARTOGRAPHY
OF LAKE SHARPE
HUGHES COUNTY
HYDE COUNTY
BROKEN ARROW SHAFT CREEK
ROCK BAR CREEK
CHAINE DE ROCHE CREEK
CHAIN OF ROCKS
CADOTTE'S WOOD YARD
MODERN SPUNK ISLAND
HYDE COUNTY
BUFFALO COUNTY
T109N
T108N
20 SEPT 1804
ST. JOHN'S WOOD YARD
NO NAME
NO NAME
NO NAME
MODERN BRULE ISLAND
SOLDIER CREEK
RED CLOUD AGENCY
LOWER BRULE
FORT THOMPSON
LOWER ISLAND CREEK
NIGHT CREEK
ELM CREEK

Figure M-2.

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VOLUME III
APPENDIX 1

ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

SECTION N

HISTORICAL BACKGROUND, LAKE SHARPE AREA, SOUTH DAKOTA

by

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APPENDIX 1, SECTION N

HISTORICAL BACKGROUND, LAKE SHARPE AREA, SOUTH DAKOTA

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HISTORICAL BACKGROUND, LAKE SHARPE AREA, SOUTH DAKOTA

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INTRODUCTION

This report offers a general history of the left bank of the Missouri River in South Dakota, from Big Bend dam to Oahe dam. While the specific area in question is a very narrow strip of land administered by the U. S. Army Corps of Engineers, the nature of historical research and the types of records upon which this investigation is based are wider in scope.

The Big Bend region, for the purposes of this study, consists of Buffalo, Hyde, and Hughes counties (Figure N-1). This is particularly the case in the use of population and geographical statistics. Given the system of records and documentation available, these are the only reasonable boundaries within which one can confine investigation. Information is simply too limited on any smaller scale.

The narrative account is larely drawn from secondary sources. General histories of South Dakota and topical studies of particular elements of the state's past form the foundation. Several previous studies of the region, on behalf of the Corps of Engineers, the Smithsonian Institution, the National Park Service, and others, offered valuable help in supplementing this base. Additional material drawn from original sources, both published and manuscript, completed the picture.

This report is primarily concerned with the territorial and early statehood period. Again, the very nature of history refuses to allow sharp chronological, or geographical distinctions. Events have their genesis in occurrences of a past time and place and these must be examined, if only superficially. Likewise, the events with which we are concerned provide additional incidents which deserve at least brief attention.

The geo-political boundaries which appear and disappear, over time, throughout the region offer a curious complexity to this study.

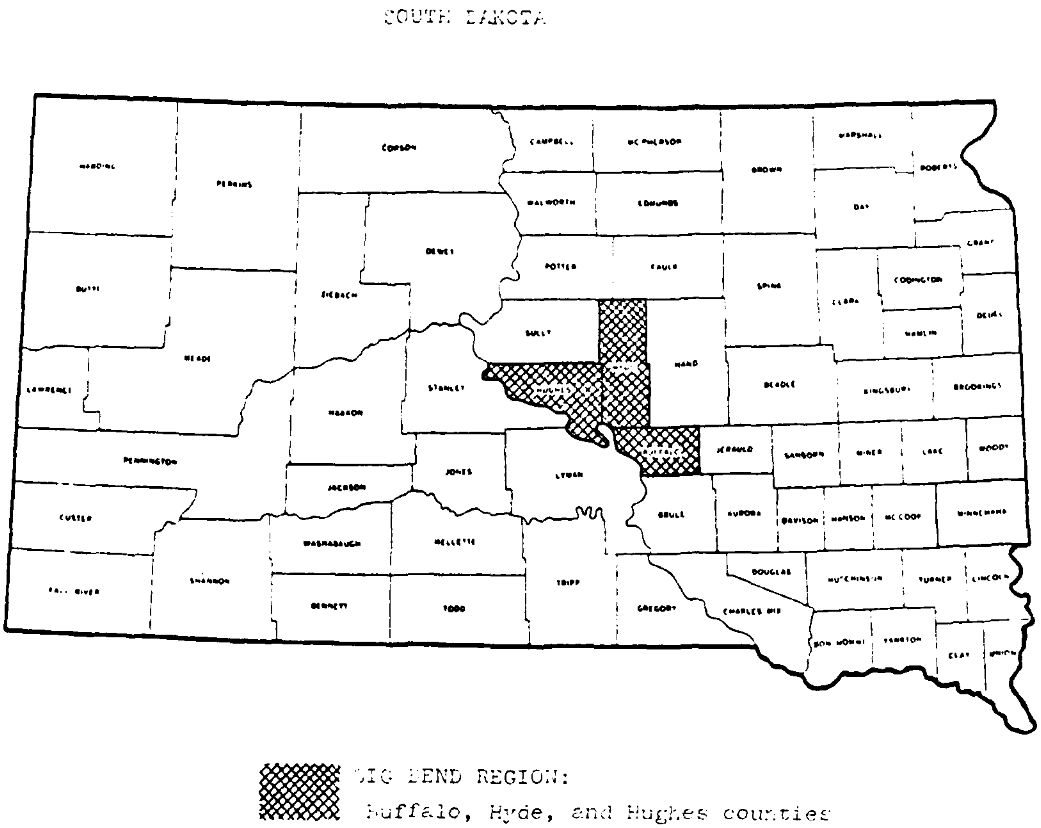

Figure N-1. South Dakota showing location of the Big Bend region.

Encompassed within this region are federal, state and local jurisdictions; often the distinctions overlap and blur. Lands that are part of Crow Creek reservation, for example, pass into non-Indian hands and the responsibility for the records of these transactions are likewise transferred.

A number of individuals provided valuable guidance through the maze. The Bureau of Indian Affairs Office, and Carol Walking Bull in particular, gave important assistance, as did the Hughes County Registrar of Deeds. Further aid came from many quarters. Virginia Driving Hawk Sneve, Historiographer of the Episcopal Church of South Dakota, very graciously traveled from her home in Flandreau to the archives in Sioux Falls, in the midst of a snowstorm, to show me records and photographs of the church's missionary activities at Crow Creek. Dayton Canaday, of the South Dakota State Historical Society; June Sampson, of the W. H. Over Museum, University of South Dakota; and Mike Cowdry, curator of the David W. Clark Memorial Collection of the Over Museum, all offered helpful suggestions and information. Professor Frederick C. Luebke read the original draft manuscript and provided a valuable critique. There are, of course, others. I thank them all.

BACKGROUND TO SETTLEMENT

Following sections summarize the early exploration and settlement of the Big Bend area by European and, later, American interests. Table N-1 provides an inventory listing of historic sites within and adjacent to the project area which reflect these activities.

EXPLORATION AND THE EARLY FUR TRADE

In 1743 a party of French explorers, seeking a route to the Western Sea, became the first European men to visit the Big Bend area. This expedition, led by two sons of Pierre Gaultier de Verennes, Sieur de La Vèrendrye, spent the winter among the Arikara near what is today the site of Fort Pierre.

Table N-1. Summary of location and identification of historic sites, Big Bend (Lake Sharpe), East Bank Project area, South Dakota.

Identification*	Site Description	Reference
La Verendrye lead plate site; Sec. 33, T5N, R31E	Outside project area	Robinson 1914; Mattison 1962; Schell 1968
Loisel's Post, or Fort aux Cedres, on Cedar Island no. 2 or Dorian Island; Sec. 2, T108N, R76W (?)	Area now inundated, exact location unknown; site is probably outside project area	Schell 1968; Mattison 1962; Higginbottham 1978; Smith 1968
Lewis and Clark campsites, Big Bend dam to Oahe dam; Buffalo, Hyde, and Hughes counties	Nine campsites, four of which are along east bank, all now inundated	Mattison 1962; Schell 1968
Fort Pierre no. 1; Sec. 16, T5N, R31E	Outside project area	Athearn 1967; Mattison 1962; Thomas 1976
Fort Pierre no. 2; Sec. 4, T5N, R31E	Outside project area	Mattison 1962
Fort Thompson, Crow Creek Agency (39BF13); Sec. 23, T107N, R72W	Original site partially inundated and destroyed by dam construction, relocated 3/4 mi. north	Annual Report 1863-1888; Danziger 1970; Meyer 1967; Mattison 1962; Wilson 1902
Crow Creek Reservation (Old Winnebago Reservation)	Agency (above) and many individual allotments within project area	Annual Report 1863-1888; Danziger 1970; Meyer 1967; Schell 1968; U. S. Census Office 1894; U. S. Bureau of Indian Affairs 1895- ; Mattison 1955
Fort Sully no. 1 (39HU62); Sec. 12, T110N, R79W	Within project area; now encompassed within Farm Island Recreation Area	Athearn 1967; Robinson 1904; Wilson 1902; Kappler 1973; Mattison 1962; Sheridan 1972; Frazer 1965

*Site numbers following names reference archeological sites with historic period material remains in the general area of the historically documented allottee or owner(s) property.

Table N-1. Summary of location and identification of historic sites, Big Bend (Lake Sharpe), East Bank Project area, South Dakota (continued).

Identification*	Site Description	Reference
Town of Fort Pierre; Sec. 28, 33, and 34, T5N, R31E	Outside project area	Schell 1968; Mattison 1962
City of Pierre; Sec. 34 and 35, T110N, R79W; and Sec. 32 and 33, T111N, R79W	Waterfront areas within project area	Robinson 1925; Lamar 1956; Mattison 1962; Schell 1968
Crow Creek Allotments (number refers to allotment number):		
Splits (or Splitz)(39BF2), no. 56; Sec. 7, T107N, R72W	Gravesites located, no specific information available	U. S. Bureau of Indian Affairs, 1895-
Red Water (39BF218), no. 814; Sec. 7, T107N, R72W	Gravesites, no specific information available	U. S. Bureau of Indian Affairs, 1895-
Wizi (39BF13), no. 54; Sec. 23, T107N, R72W	Donated 1.25 acre plot for Agency cemetery	U. S. Bureau of Indian Affairs, 1895- ; Biller 1916; Annual Report 1897
Red Bull, no. 55; Sec. 23, T107N, R72W	Within project, destroyed by dam construction	U. S. Bureau of Indian Affairs, 1895-
Christ Church; Sec. 23, T107N, R72W	Church building relocated 3/4 mi. north; original site destroyed by dam construction	U. S. Bureau of Indian Affairs, 1895- ; Annual Report 1881; Biller 1916; David W. Clark 1978
White Buffalo Walker (39BF34, 39BF216), no. 61; Sec. 1, T107N, R73W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Annual Report 1881
Slapping (39BF33), no. 46; Sec. 26, T108N, R73W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Annual Report 1880, 1881

Table N-1. Summary of location and identification of historic sites, Big Bend (Lake Sharpe), East Bank Project area, South Dakota (continued).

Identification*	Site Description	Reference
Fire Tail (39BF35, 39BF37), no. 44; Sec. 35, T108N, R73W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Annual Report 1880, 1881
Butcher (39BF38, 39BF39), no. 45; Sec. 35, T108N, R73W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Annual Report 1880, 1881
Mark Wells (39HU86), no. 235; Sec. 10, T108N, R74W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916
Mrs. St. John, no. 545; Sec. 10, T108N, R74W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916
Henry Jacobs (39HU91), no. 800; Sec. 19, T108N, R74W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916
Stephan Four Eagle (39HU90), no. 618; Sec. 20, T108N, R74W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Annual Report 1880, 1881; Hughes County Atlas 1916
Margaret (or Maggie Boy, or Pe duta)(39HU89), no. 824; Sec. 27, T108N, R74W	Diamond J Ranch	U. S. Bureau of Indian Affairs, 1895-
Mattie Kamery (or Kemery)(39HU93), no. 839; Sec. 28, T108N, R74W	Farmstead site	U. S. Bureau of Indian Affairs 1895- ; Hughes County Atlas 1916; Hughes County Registrar of Deeds
Lulu Two Arrows (39HU107, 39HU108), no. 579; Sec. 35, T108N, R74W	Farmstead site	U. S. Bureau of Indian Affairs 1895- ; Hughes County Atlas 1916
Follows Her (39HU215), no. 602; Sec. 19, T108N, R75W	Earthwork	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916; Hughes County Registrar of Deeds
Mrs. Emma Berry (39HU110), no. 620; Sec. 23, T108N, R75W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916; Hughes County Registrar of Deeds

Table N-1. Summary of location and identification of historic sites, Big Bend (Lake Sharpe), East Bank Project area, South Dakota (continued).

Identification*	Site Description	Reference
Malvina E. Ashley (39HU96, 39HU228), no. 1595; Sec. 13, T108N, R76W	Farmstead site	U. S. Bureau of Indian Affairs, 1895-
Sergeant (39HU92), no. 526; Sec. 24, T109N, R74W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916
Snow Flies, no. 580; Matthew Different Horse, no. 544; Sec. 23, T109N, R74W	Farmstead site	U. S. Bureau of Indian Affairs, 1895- ; Hughes County Atlas 1916
Henry White Dog (39HU218), no. 667; Sec. 12, T108N, R76W	Depression	U. S. Bureau of Indian Affairs, 1895-
Own Medicine (39BF8), no. 77; Sec. 24, T107N, R72W	Burials	U. S. Bureau of Indian Affairs, 1895-
Leon Kirkie, Jr. (39BF36), no. 1453; Sec. 24, T108N, R73W	Farmstead	U. S. Bureau of Indian Affairs, 1895-
Daisy Track (39BF53), no. 1405; Sec. 24, T108N, R73W	Depressions	U. S. Bureau of Indian Affairs, 1895 -
Frank Pamani (or Pammani)(39BF55), patent; Sec. 15, T107N, R72W	Foundation and burial	U. S. Bureau of Indian Affairs, 1895-
Frog (39BF56), patent; Sec. 17, T107N, R72W	Depression	U. S. Bureau of Indian Affairs, 1895-
Little Elk (39BF57), patent; Sec. 17, T107N, R72W	Depression	U. S. Bureau of Indian Affairs, 1895-
Red Elk (39BF57, 39BF219); Sec. 17, T107N, R72W	Depressions and burials (?)	U. S. Bureau of Indian Affairs, 1895-

Table N-1. Summary of location and identification of historic sites, Big Bend (Lake Sharpe), East Bank Project area, South Dakota (continued).

Identification*	Site Description	Reference
<u>Homestead and purchase sites</u> (name indicates earliest known owner):		
June Lamb; Sec. 1, T109N, R76W	Farmstead site	Hughes County Registrar; Hughes County Atlas 1916
William H. Weihrouch (39HU304); Sec. 2, T109N, R76W	Farmstead site	Hughes County Registrar; Hughes County Atlas 1916
W. S. Harvey (39HU210); Sec. 3, T109N, R76W	Farmstead site	Hughes County Atlas 1916
Zack (or Jack?) Thomson (39HU242); Sec. 3, T109N, R76W	Farmstead site	Hughes County Registrar; Hughes County Atlas 1916
Winfield S. Thomson (39HU116); Sec. 4, T109N, R76W	Farmstead site	Hughes County Registrar; Hughes County Atlas 1916
George Ross (39HU118); Sec. 4, T109N, R76W	Farmstead site	Hughes County Atlas 1916
Oscar Everson (39HU119, 39HU123, 39HU125); Sec. 5, T109N, R76W; Sec. 31, T110N, R76W	Farmstead site	Hughes County Atlas 1916
George Farrington (39HU243); Sec. 5, T109N, R76W	Farmstead site	Hughes County Atlas 1916
Williard Leischer (or Leascher) (39HU117); Sec. 5, T109N, R76W	Farmstead site	Hughes County Registrar; Hughes County Atlas 1916
Fred Baade (39HU123); Sec. 31, T110N, R76W	Farmstead site	Hughes County Atlas 1916
H. L. Jones; Sec. 1, T109N, R76W	Farmstead site	Hughes County Atlas 1916

Table N-1. Summary of location and identification of historic sites, Big Bend (Lake Sharpe), East Bank Project area, South Dakota (concluded).

Identification*	Site Description	Reference
School Lands (39HU111, 39HU112); Sec. 36, T110N, R76W	Structural remains	Hughes County Atlas 1916
Allison Howes, Jr. (39HU102, 39HU203); Sec. 22, T110N, R77W	Farmstead site atop prehistoric site	Hughes County Registrar; Hughes County Atlas 1916
C. Roadman (39HU970); Sec. 7, T110N, R78W	Farmstead site	Hughes County Atlas 1916
C. H. McKee (39HU135); Sec. 8, T110N, R78W	Farmstead site; Chicago & North Western Railroad	Hughes County Atlas 1916
George Hoye (39HU124); Sec. 31, T110N, R76W	Depression	Hughes County Registrar; Hughes County Atlas 1916
Joseph McKnight (39HU128); Sec. 25, T110N, R77W	Foundation	Hughes County Registrar
William Zolk (39HU129); Sec. 26, T110N, R77W	Farmstead	Hughes County Registrar
Patrick H. Laudy (39HU130); Sec. 17, T110N, R77W	Farmstead	Hughes County Registrar
Marcel C. Rousseau (39HU114); Sec. 22, T110N, R77W	Depression	Hughes County Registrar
Henry L. Jones and Albert Hillert (39HU205); Sec. 1, T109N, R76W	Artifacts	Hughes County Registrar

*Site numbers following names reference archeological sites with historic period material remains in the general area of the historically documented allottee or owner(s) property.

La Vérendrye, a native of Canada, earnestly hoped to discover a passage through the mountains to the Pacific Ocean. As early as 1726 he sought financing for such an expedition. Having obtained an unenthusiastic commitment from the government of France, which included a monopoly on the fur trade in the country he explored, he set about his mission. French policy required La Vérendrye to establish outposts to secure French influence in this new territory and to placate the Sioux. By 1734 he had built forts in Canada at Rainy Lake, Lake of the Woods, and Lake Winnipeg. From these posts he collected furs with which to finance his explorations (Nasatir 1952:31-32).

La Vérendrye was seemingly plagued by both the lack of adequate resources and personal misfortune. Numerous false starts and recurring setbacks blocked his efforts to reach the Western Sea. His nephew, who had worked closely with him, died. Despite his entreaties, France still refused to make a definite financial commitment to the enterprise.

In 1738, accompanied by his four sons, Pierre, Jean Baptiste, François, and Louis Joseph, and a young missionary, Father Aulneau, he renewed his efforts. After building a base camp, Fort La Reine, on the Assiniboin River in Manitoba, the party set out to visit the Mandan to the south. Upon reaching the Mandan villages on the Missouri, and believing them to be close to California, La Vérendrye was convinced that he was on the verge of fulfilling his mission. He was encouraged in this belief by the Indians. His party then returned to Canada, leaving two of their number behind to learn the Mandan language. La Vérendrye reported to the governor of Quebec that he was near success. The governor relayed the report to France, where the news was "mildly welcomed". Further substantiation was requested, and La Vérendrye once again laid plans for further exploration (Nasatir 1952:32-33).

Business problems seem to have prevented Pierre La Vérendrye from personally participating in the new expedition. In his stead, he sent two of his sons, François and Louis Joseph, the Chevalier de La Vérendrye. In April, 1742, the two brothers and their party

set out from Fort La Reine. They returned to the Mandan villages, near present-day Washburn, North Dakota (Nasatir 1952:33; Robinson 1914:147). Rejoining their countrymen, and obtaining guides from the Indians, they traveled west-southwest until, sometime in November or December, they met a group whom they referred to as the "Bow Indians". One historian, D. Robinson, believes that these were the Arikara. The French party followed this band on an expedition against their enemies to the west, who have been identified as Kiowas then living in the Black Hills. Finding the enemy's camp deserted and fearing a trap, the entire group retreated (Robinson 1914:147-150; Mattison 1962:37).

With winter making travel difficult, the Arikara directed the La Vèrendrye party to the village of their kinsman, Little Cherry. The French arrived at his camp on March 19, 1743. It was there, near today's Fort Pierre, that the Chevalier buried an inscribed lead plate. Rediscovered on February 16, 1913, this plate documents the La Vèrendrye expedition into the Big Bend region (Robinson 1914:146,148; Mattison 1962:36-37).[1]

Although the authenticity of the plate is unquestioned, scholars disagree on who buried it and on its precise translation. The front of the plate is distinctly engraved (it has been prepared before the expedition departed Canada) and provokes little discussion. It reads:

> Anno XXVI Regni Ludovici XV Prorege Illustrissimo Domino Domino Marchione de Beauharnois MDCCXXXXI Petrus Gaultier de Leverendrie Posuit
>
> (In 1741, the twenty-sixth year of our most illustrious Seigneur Louis XV, in the time of his Viceroy, Monseigneur the Marquis de Beauharnois, Pierre Gaultier de Levèrendrie deposited [this]).

The reverse, however, was crudely inscribed in French. It is apparent that the legend was added just before the plate was buried. Herbert Schell transcribes the inscription thus: "Pose par le chevalyet de Lav to jo Louy la Londette Amiotte le 30 de mars 1973", and notes that Nellis M. Crouse, the senior La Vèrendrye's biographer, "construes it as follows: 'Placed by the Chevalier de la Vèrendrye, witnesses Louis, La Londette, Amiotte.'"

Crouse believes that Louis Joseph, the Chevalier, buried the plate while two voyageurs looked on, and that François was not present (Schell 1968:28-29; Robinson 1914:146-147).[2]

The expedition returned to Canada, having ascertained that the Missouri River continued southward--not to the west as they had believed. The La Vērendrye family fell into disfavor with the French Government and their explorations came to an end. Others continued to explore the region on behalf of the French for the next twenty years, and relied heavily on La Vērendrye's geographic observations.

By virtue of the Treaty of Paris of 1763, following the French and Indian War, France ceded her possessions west of the Mississippi to Spain. Anxious to secure her claim to the area, and to discourage encroachment by fur trappers working for the French and the British, the Spanish government granted an exclusive franchise to the newly formed Missouri Company. Based in St. Louis, the company sought to "trade with the Indian tribes of the Missouri. . .that are found farther up than the Poncas" (Nasatir 1952:217-218).

The company's first trading expedition, undertaken by Jean Baptiste Trudeau in 1794, was a dismal failure. Trudeau was inexperienced in dealing with the Indians and thoroughly unqualified for his assignment. In September, in the vicinity of present-day Fort Thompson, he was accosted by a party of Teton Sioux who frightened him and robbed him of much of his merchandise. The Sioux held Trudeau for several days, until he managed to escape and, after sinking his boat, fled to the friendly Arikara on foot (Robinson 1924:4-5).

Later operations of the Missouri Company fell to more experienced hands. In 1800 the company licensed Regis Loisel to establish a post and to trade on the Upper Missouri. He built Fort aux Cedres on the south end of Cedar Island, just west of the Big Bend, in the winter of 1803. Members of the Lewis and Clark expedition wrote detailed descriptions of the post. The main structure was 32½ ft. by 45½ ft. and was surrounded by a stockade some 65 ft. square. In 1806

the fort was still standing, apparently abandoned, when Lewis and Clark passed it on their return (Schell 1968:36; Mattison 1962:23-24). The Wind--Roan Bear Winter Count of the Yanktonai Dakota marks the winter of 1808-1809 with the burning of Loisel's post; several other counts depict the event and indicate that Loisel died in the fire (Higginbotham 1978:7.11-13). G. Hubert Smith, writing for the Smithsonian Institution River Basin Survey, says that Loisel was already dead in 1806 when Lewis and Clark returned. The normal shifting of the river channel, aided by rain, flood, wind, and dust storms, obliterated any trace of the post. In 1963 an archeological investigation found no evidence of the fort, nor any indication of a fire (Smith 1968:47-51).

Spain's operations on the Upper Missouri were moderately successful. Although, like the French, the Spanish were thwarted in their desire to discover a route to the Western Sea, they exploited the resources of the region and carried on a lucrative trade with the Indians. The Spanish era ended with the secret Treaty of San Ildefonso of 1800, in which the territory was returned to France.

In 1803 the United States purchased the Louisiana Territory from France and prepared to investigate the acquisition. Lewis and Clark, leading a party of more than thirty men, set out from St. Louis in May of 1804. They encountered Pierre Antoine Tabeau, an agent of Loisel's who was returning to St. Louis, and informed him of France's cession (Schell 1968:36). The expedition, traveling in a keel-boat and two pirogues, entered the Big Bend region on September 19, 1804 (see Appendix 1, Section M, this report, especially Figure M-2). They camped along the banks of the river each night for the nine days it took them to reach the vicinity of the present Oahe Dam site. The official journals, and those of the several individual members of the party, are filled with descriptions of the area and its inhabitants. Big Bend, or the Grand Detour, was estimated at thirty miles around. Pacing off the distance across the neck of the bend, they put it at 2,000 yards (Mattison 1962:9-11).

On their return trip, having sighted the Pacific Ocean on November 15, 1805, Lewis and Clark reported sighting American fur trappers entering the Indian country. The return voyage down the Missouri River was, of course, much swifter and the explorers camped only one night, August 26, 1806, in the Big Bend region (Schell 1968:37-43; Mattison 1951:2-3, 1962:21).

With American acquisition of the territory began another period of exploitation, with one important difference: information relayed to the east by trappers and traders reached the ears of individuals interested in a more permanent settlement of the Great Plains. While American expansion skirted the Great American Desert for a time--the unique difficulties of the territory were considered, and more immediately habitable areas were settled--the Great Plains held the potential to provide homes for the nation's generations to come.

THE MILITARY ON THE FRONTIER

The native inhabitants of the Plains were one of the most formidable barriers to permanent settlement. Regardless of the very real distinctions, and often the incompatibility of the various tribes indigenous to the territory, most Americans saw only "Indians"--and saw them as a serious threat to any prospective colonization of the Plains.

In September, 1819, Colonel Henry Atkinson led an expedition up the Missouri River, ostensibly to discourage British fur trappers in the area (Mattison 1956:160-161). However, Benjamin O'Fallon, the newly assigned Indian Agent on the Missouri, was ordered to precede the expedition, "in order to prepare the Indians for it, by a representation of our pacific views, . . ." (Mattison 1958:245). A groundwork was being laid for dealing with the Indians of the Plains and, if they would not cooperate, for bending them to the government's will.

Acting on orders from Secretary of War John C. Calhoun, Atkinson was to establish a post at the mouth of the Yellowstone River

and another at the Mandan villages in present-day North Dakota. The so-called "Yellowstone expedition" found progress up the Missouri extremely difficult. In accordance with contigency plans, anticipating this, the expedition halted near what is today Fort Calhoun, Nebraska. On the bottomland immediately adjacent to the river (the precise location is unknown) Atkinson set his troops to work constructing temporary winter quarters. "Cantonment Missouri" was poorly located and shabbily constructed and the expedition spent a thoroughly uncomfortable winter. In the spring, Congress refused to appropriate additional funds to continue the project, and Atkinson's troops--the Sixth Infantry--were put to work constructing a permanent military post. A more suitable site was selected on the higher ground of "the Council Bluffs, where Lewis and Clark held a general council with the Indians. . ." (Johnson 1957:232).[3] The new cantonment was named Fort Atkinson, and represented America's remotest outpost on the Plains.

In 1823, O'Fallon and Colonel Henry Leavenworth, commander of Fort Atkinson, received word that a party of fur traders had been attacked, and several killed, by the Arikara upstream. Mounting a force of 220 men, later supplemented by some 120 fur trappers and as many as 800 Sioux, Leavenworth set out to punish the Arikara. There are conflicting reports as to the specific engagements of this campaign but the results are clear: the Arikara were put to flight. This no doubt solidified their hostility to whites but it also served to remove them as a hindrance to trade for some time to come (Nichols 1965:84-87; Mattison 1956:162-163; Fletcher 1975:84).

In May, 1825, following a congressional appropriation of \$20,000 to "cope further with the hostile Indian tribes", Henry Atkinson, now a brigadier general, and Benjamin O'Fallon led a large expedition back up the Missouri River. They held councils and concluded agreements with the Sioux, Ponca, Hidatsa, Mandan, and Crow, as well as the Arikara. Before returning in September, they also established Camp Barbour at the mouth of the Yellowstone (Nichols 1965:90-108; Mattison 1956:162-163).

The Atkinson-O'Fallon Commission signaled the beginning of 30 years of relative calm on the Northern Plains. The American Fur Company had established and successfully defended a monopoly on trade in the area, and built a number of fortified posts from which to carry on business.

In the 1850s American settlement was poised on the periphery of the Plains. Colonists were traveling the cross-country trails to California in ever-increasing numbers, and people were beginning to appreciate the agricultural potential of the "Great American Desert". As a result, tensions between white and Indian were growing.

1854 saw the first serious rupture of the peace. A small military mission was dispatched from Fort Laramie to recover a cow stolen by a party of Brûlé Sioux. The Sioux massacred the party, and the following year, General William S. Harney led a force of 1,000 men onto the Northern Plains to retaliate. Needing supply depots, the Army purchased the American Fur Company's Fort Pierre and outfitted it to serve as a cantonment for Harney's troops. The arrival of six companies of infantry, in July and August 1855, marked the beginning of a military presence in central South Dakota which would continue into the 1890s (Schell 1968:66-68; Athearn 1967:33-53).

Fort Pierre, named for Pierre Chouteau, Jr., was built in 1832 to replace Fort Tecumseh a few miles downstream. The post served as one of the American Fur Company's main "ports" until 1855, when the Army purchased it for $45,000 (Athearn 1967:36).

In 1833 Alexander Phillip Maximilian, Prince of Wied-Neuwied, made an extended journey up the Missouri River, taking with him the Swiss artist Karl Bodmer. He landed at Fort Pierre on May 30, and his journal provides a detailed description of the post:

> Fort Pierre. . .forms a large quadrangle, surrounded by high pickets. At the north-east and south-west corners there are blockhouses, with embrasures; the upper story is adapted for small arms, and the lower for some cannon; each side of the quadrangle is 108 paces in length; the

> front and back, each 114 paces; the inner space eighty-seven paces in diameter. . . .The timber for this fort was from forty to sixty miles up the river, and floated down, because none fit for the purpose was to be had in the neighborhood (Thomas 1976:28-29).

The Army had been warned that the post was not large enough to accommodate their purpose. The first troops to arrive brought prefabricated barracks with them as they traveled upriver by steamboat. Additional log houses were constructed to create enough shelter for Harney's troops, who wintered there (Athearn 1967:35-45; Mattison 1962:42-43).

By 1855 Fort Pierre had deteriorated considerably. Forage and firewood were unavailable in the immediate area. The troops expressed their opinion of the place with the following verse:

> Oh, we don't mind the marching,
> nor the fight do we fear,
> But we'll never forgive old Harney
> for bringing us to Pierre.
> They say old Shotto [Chouteau] built it,
> but we know it is not so;
> For the man who built this bloody ranche,
> is reigning down below. (Athearn 1967:41-43)

Harney agreed. After searching throughout the winter, he selected the site for a new post and Fort Randall was begun in the summer of 1856. The Army abandoned Fort Pierre in 1857 (Mattison 1962:43).

A new crisis arose in the summer of 1862. The Santee Dakota committed a series of raids and killings throughout southern Minnesota, culminating with two attacks on the town of New Ulm. With the military strength of Minnesota firmly committed to the Civil War, the Indians' boldness created panic among the settlers. The conflict was in danger of spreading into the Dakota Territory. Federal troops were brought in to quell the uprising after some 450 lives were lost. The Army apprehended many of the hostiles and 38 of the leaders were hanged. This was not enough to soothe an outraged public; the people of Minnesota demanded that the Indians be removed from the state (Howard 1976:55; Merk 1978:420; Athearn 1967:90-98).

The Minnesota uprising had two effects of importance to the history of the Big Bend region: Secretary of the Interior Caleb Smith

made the decision to remove the Minnesota Indians to a reservation "on the Missouri River. . .within a hundred miles of Fort Randall" (Meyer 1967:142); and General Alfred H. Sully was dispatched from Fort Randall, in 1863, as part of a campaign to punish the Sioux in the Dakota Territory for their role in the conflict (Mattison 1956:166, 1962:30-31). The first action led to the establishment of Fort Thompson and the Crow Creek Reservation; the second brought about the construction of Fort Sully.

FORT THOMPSON, 1863-1866

The fear and the wrath of the people of Minnesota were not confined exclusively to the participants in the uprising of 1862; they were not content to punish just the Santee Sioux. The settlers demanded that the state be cleared of all Indians. Thus the Winnebagoes, who had no part at all in the conflict, were to be included in the removal plans (Robinson 1904:215).[4]

Colonel Clark W. Thompson, head of the Northern Superintendency under the Commissioner of Indian Affairs, was responsible for implementing the Secretary of the Interior's instructions on relocation. He personally inspected the region, following the Missouri River north from Fort Randall, and on May 28, 1863, he wrote the Commissioner from a point "eight miles above Crow Creek":

> I have examined the river from Fort Randall, and have located here. I have the best place I have seen on the river--good land and timber for this country. . . . I believe this is about the location the Secretary expected me to make; it is the best there is here anyway, so that I hope for your and his approval (Annual Report, 1863:316).

It was Thompson's idea to set up two reservations--one for the Santee and one for the Winnebagoes--with a combined agency to govern them. In laying out the building plans he "made the line dividing these reservations run through the center of the stockade, putting the Winnebago buildings on the west side and the Sioux on the east. . ." (Annual Report 1863:318).

Supplies and building materials were freighted up the Missouri or, when the river was unnavigable, shipped overland. Construction

commenced on June 1. By the end of the month Thompson was working out of a temporary office, agency buildings and warehouses were begun, and the complex was surrounded by a temporary stockade of cottonwood logs (Annual Report 1863:317, 319).

In the meantime, Superintendent Thompson's brother, Benjamin, supervised the transportation of the Sioux from Fort Snelling, Minnesota. On May 4 and 5 over thirteen hundred Santee men, women, and children were loaded aboard two steamboats, the Davenport and the Northern, and transferred to their new home. They arrived at the reservation on June 1. The Winnebagoes arrived in three groups from June 8 through 24, numbering some 1,945 persons in all (Annual Report 1863:317-322; Danziger 1970:106-108; Meyer 1967:145).

Colonel Thompson hoped to make the Indians self-sufficient--or at least contributing substantially to their own upkeep--as quickly as possible. One of his first moves was to put Chester Adams, the reservation farmer, to work breaking fields. Although Thompson's reports to the Commissioner hedged on the subject, the plan was a failure from the start. South Dakota was in the midst of a drought cycle; the ground was parched and barren. The plows purchased for the Indians were no match for the hard sod, and broke repeatedly. Thompson complained that he didn't have "a smith who understands making ploughs for this soil". Still, the Sioux were willing to work, he reported, and took "a great interest in their farms". In quiet understatement, he admitted that "this year they cannot count on producing much" (Annual Report 1863:321).

Thompson thought the weather was unusual; more experienced hands thought he had made a hasty, unfortunate choice of lands. General Alfred Sully, leading his troop north against the Sioux, was forced to lay over at Crow Creek to await supplies. He took the opportunity to listen to complaints from the Winnebagoes, some of whom he knew from his days in Minnesota. Sully, a compassionate man despite his adversary role, relayed their concerns about the reservation to General John Pope, who passed them on to Secretary of War Edwin M. Stanton. Sully also wrote to the Secretary of

the Interior, J. P. Usher, informing him that, "In the selection of their new locality for their reservation, I do not think good judgement has been used". Moreover, he continued:

> The land is poor; a low, sandy soil. I don't think you can depend on a crop of corn, even once in five years, as it seldom rains here in the summer. There is no hunting in their immediate vicinity, and the bands of Sioux near here are hostile to [the Winnebagoes] (annual Report 1863:322-323).

He explained that the Winnebagoes were already at work building canoes, with plans for joining their friends, the Omaha, to the south. Although Sully thought this the best solution to their predicament--for whites and for the Indians--his duty required him to inform them "they must stay here until they get permission from Washington to move". He ordered his troops, stationed down river, to fire on the Indians should they attempt to escape (Annual Report 1863:323).

With the first crop a failure, Thompson was forced to call for help. Food and supplies had to be shipped in to prevent the Indians from starving. Crow Creek was isolated from any convenient source of supply, particularly so because of the low water--and resultant unnavigability--of the Missouri River. Plans were made to ship pork and flour, and 300 head of beef, overland from Minnesota. The "Moscow expedition", as it came to be called, left Mankato on November 5, 1863. After an arduous journey, 136 wagons arrived at Fort Thompson on December 2 (Danziger 1970:109-110; Robinson 1924:8). Roy Meyer, in his History of the Santee Sioux, claims that the meat and flour had been "condemned as unfit for consumption by soldiers". The cattle were emaciated by the long drive. Nonetheless, the provisions managed to save the Indians and the agency garrison from starvation (1967:147).

In 1864 Sergeant J. H. Drips, of the Sixth Iowa Cavalry, described the completed agency:

> It is laid out in a square some three hundred feet each way. Around the whole square was dug a ditch some three feet deep, and the same width. In this are set cedar pickets fifteen feet long, which leave them twelve feet

> above the ground. On the west side are two stores and one warehouse, just coming out flush with the pickets. On the north side is the Winnebago school house, the interpreter's quarters, the agent's quarters, and the doctor's quarters. On the corner were barracks for soldiers. On the east side are the boarding house, blacksmith, wagonmaker's and carpenter shops. On the south side are the Sioux buildings, one doctor's quarters, two agents' quarters, the three interpreters' quarters, and four school houses, and on the corner, barracks for soldiers. On the northwest and southeast corners are bastions outside the pickets. The pickets are sawed on three sides, the outsides being left rough. Holes for guns were made some eight feet from the ground and about twelve feet apart. On the north and south sides are each a gate, made of the same kind of material as the pickets. The saw mill is on the west side of the fort and about fifteen rods from it in the edge of the timber. Still further on in the timber are the Indian wigwams. The river is about half a mile from the fort and pretty heavy timber [sic]. It is situated on a beautiful plain, and in a fine place for defense (Wilson 1902:301).[5]

The agency was known locally as "Fort Thompson", for its military appearance and similarity to the fur traders' forts; officially it was the Winnebago or Crow Creek Agency.

Despite the sergeant's impression of a "beautiful plain" the Indians' agricultural efforts continued to produce nothing. In September, 1864, a group of missionaries wrote to Secretary of the Interior Usher urging him to return the Indians to Minnesota, even in light of the "strong prejudices there existing against these Indians" (Annual Report 1864:420-422).

> For two years [they explained] much corn has been planted on the reservation here, and has been well cultivated, but the first small ear has never yet attained to the roast-ear state. This year considerable barley was sown as early as practicable, before the frost was out of the ground, but even then there was so little moisture in the ground that very little of it grew, and it was doubtful whether there would be any worth cutting, when the grasshoppers came and devoured it all (Annual Report 1864:420).

The winter of 1864 promised starvation again, and relief was once more dispatched from Minnesota.

Superintendent Thompson again came under fire. The missionaries, one of whom had accompanied the Sioux on their removal from Minnesota,

informed the Secretary, "When Colonel Thompson selected this region . . .it was supposed to be a country in which men might live by cultivating the earth. No person with whom we have met here now believes this to be the case". Of the thirteen hundred Sioux brought to Crow Creek, they estimated that "not more than three-fourths" were still alive (Annual Report 1864:420).

The Winnebagoes had been temporarily dissuaded from escaping by Sully's threats, but the general could not guard them long. With conditions continually deteriorating, they began to find their way south to the Omaha reservation. By 1865 almost the entire group had left Crow Creek and the government was forced to acknowledge the fact. Rather than attempt to return them, a treaty was negotiated with the compliant Omahas, granting the Winnebagoes a portion of their lands (Meyer 1967:148).

The years at Crow Creek took a heavier toll on the Santee. A peace commission headed by territorial governor Newton Edmunds, visiting the reservation in the fall of 1865, deplored the "state of semi-starvation" in which they found the Sioux. They recommended they be moved. A reservation was laid out on the Niobrara River and, in April 1866, the Santee were relocated once more (Meyer 1967: 153-155; Schell 1968:90-91).

FORT SULLY

As a result of the outbreak of violence in Minnesota, General John Pope mounted a campaign against the Sioux in the spring of 1863. Determined to catch the Indians in a two-pronged attack, he dispatched General Henry H. Sibley from Minnesota, with orders to drive the Indians west to the Missouri. General Alfred Sully, leading a force of some 2,500 men, was to converge from the south, having traveled upriver from Fort Randall. At the juncture, according to Pope's plan, the Sioux would be forced to sue for peace or be annihilated (Athearn 1967:103; Robinson 1904:215).

Pope's strategy might well have succeeded but for one flaw: he failed to take into account the vagaries of the Missouri River.

The drought which was proving so calamitous to the Indians at Crow Creek slowed Sully's progress up the river to a crawl. While Sibley fought and won a number of battles, pushing the Sioux back each time, Sully and his troops struggled northward. Sibley pursued the Indians as far as the Missouri and the intended link-up with Sully. The Indians crossed the river and Sibley, having received no word from Sully, returned to Minnesota. Sully's troops fought one major engagement at white Stone Hill, near today's Ellendale, North Dakota. Having learned of Sibley's withdrawal and running low on supplies, Sully made a hasty march back to Fort Pierre (Robinson 1904:215). General Pope was furious with Sully's delays and failure to rendezvous with Sibley. He ordered him to take on supplies, cross the river, and pursue the Sioux, preventing "in all events their return to the borders of Minnesota in any large force" (Wilson 1904:308-309).

By the time Pope's instructions reached him, Sully was preparing his troops for the winter. An additional campaign was out of the question. Some of his troops were mustered out, having served out their enlistment; others were dispatched downriver to Fort Thompson and Fort Randall. The remainder went into winter quarters at Fort Sully. The construction of this post was started while Sully was trudging northward; on October 13, 1863, it was ready for occupancy and Lieutenant Colonel E. M. Bartlett led members of the Thirtieth Wisconsin and the Sixth and Seventh Iowa Cavalry onto the post, which he named after General Sully (Wilson 1902:390-310).

The location for the fort, about six miles below present-day Pierre, was well known to Sully. Campaigning under General Harney in 1855-56, the area was often scoured for wood for Fort Pierre by Sully and his men. Sergeant Drips, who had helped to build the post, described it in detail in his journal:

> Sully is situated on a plain or bottom of the Missouri River, on the east side, about eighty rods from the river. It is opposite or a little above Farm Island. It is built on two sides, east and west, with barracks; on the north and south with pickets. The buildings are of cottonwood logs, unhewn, and are about seven or eight feet high, covered over with logs and brush and then

> earth thrown over them. The pickets are the same material, set into the ground about three feet, standing out some twelve feet above ground. The fort is 270 feet square, and there are bastions on the southeast and northwest corners, in which are placed cannon for the defense of the fort. This is pretty well fixed for defense, and cannot be taken very easily by the Indians,. . .(Wilson 1902:310).

The troops endured an especially harsh winter at Fort Sully. In mid-October a blizzard piled snowdrifts as high as twenty-five feet. All the while, plans were being made by Sully and Pope for the next summer's campaign (Robinson 1904:216; Athearn 1967:124-132).

Fort Sully continued as a base of operations and supply depot for military expeditions in Dakota for the next two years. In 1865 Territorial Governor Newton Edmunds, in his capacity as ex officio Superintendent of Indian Affairs, headed a treaty commission convened at the post. Throughout October, treaties were negotiated and concluded with the major tribes and bands of the Dakota (Kappler 1973:883-887, 896-908; Athearn 1967:207-210).

Fort Sully had been constructed hurriedly, as a temporary post, and by 1866 was showing the effects. Colonel Delos B. Sacket was dispatched in April to inspect the Army's installations along the Missouri. At Fort Sully he reported despicable conditions. The post was overrun with rats, bedbugs, and fleas. The living quarters, kitchens, and hospital were, by his account, uninhabitable. He unequivocally recommended the place be abandoned (Athearn 1967: 214-215, 217-220; Mattison 1962:31).

Lieutenant Colonel George S. Andrews, who was assigned to take over as commander of Fort Sully, scouted a new location for the post. The new site, thirty miles upriver from the original fort, offered all that the old location did not--a suitable steamboat landing, and plenty of forage and timber. Andrews set a crew to work building the new fort. On July 25, 1866, with the new fort ready for occupancy, the original Fort Sully was abandoned; the new post was immediately known as New Fort Sully (Athearn 1967:220; Sheridan 1972:31; Frazer 1965:137-138).

Old Fort Sully and Fort Thompson were both established in the same year, 1863. Now, in 1866, Fort Sully was discarded and

Fort Thompson was undergoing a change of occupancy. The Winnebagoes were established on their new reservation in Nebraska, as were the Santee. Although Crow Creek Reservation had proved a failure as a home for these people, the government was determined to utilize the land and the agency. Accordingly, under conditions established in the treaty negotiations at Fort Sully in October, 1865, the Lower Yanktonai, a subdivision of the Dakota tribe, were gathered on the reservation.

ORGANIZATION AND SETTLEMENT

FORT THOMPSON FROM 1866

The Dakota Territory was formally organized under the Organic Act of March 2, 1861. The territorial capital was located in Yankton and, for the first decade, settlement concentrated in the southeast corner of the region, where there was adequate water and timber and reasonable access to the transportation routes of Minnesota and Iowa.

The Big Bend region was relatively isolated and slow to attract settlers. The Missouri River was difficult to rely on; shifting currents and a constantly changing channel made navigation troublesome; periodic drought made it impossible. In the winter, ice choked the river and closed it to traffic. Without reliable access to distant markets, to sell their crops and purchase supplies, prospective homesteaders sought land elsewhere.

Fort Thompson continued to serve as the agency for Crow Creek reservation when the Lower Yanktonai were given the land. Although general control of Indian affairs passed from the War Department to the then newly created Department of the Interior in 1849, military officers governed agencies in areas of strife during the Indian wars. Crow Creek fell under this heading until 1871. President Ulysses S. Grant's "peace policy" instituted further changes for the Indians: in 1869 control over Indian matters passed to a board of commissioners, who selected agents for the various

reservations from representatives of the major religious denominations who had shown serious concern over the administration of Indian affairs. The Protestant Episcopal Church was assigned to Crow Creek, as well as a number of other agencies in Dakota and Nebraska (U. S. Census Office 1894:62-63; Mattison 1955:144-145).

The buildings at Fort Thompson were rapidly deteriorating. In 1879 William G. Dougherty, the acting agent, wrote that he had removed the stockade and bastions and enclosed the agency, about 450 by 650 feet, with a picket fence. He continued, noting that:

> . . .many of the buildings turned over by the War Department still remain but these having never been repaired are in so dilapidated a condition that it is necessary to remove them as soon as possible and replace them by more substantial structures. This is being done gradually (Annual Report 1879:24).

By 1881 Dougherty reported that "the reconstruction of the agency is almost finished". The last of the old "garrison" buildings were being removed and considerable new construction was underway (Annual Report 1881:32).

The most dramatic change at Crow Creek, however, was in land usage. Agent Dougherty informed the Commissioner of Affairs that:

> . . .until this year this tribe has cultivated the soil in common under the control of the chiefs, and in small patches only. The result has been practically nothing. Last year [1878] I subdivided about half the agency farm and allotted it to individuals, and although a fair crop was made the net product was about the same, the common right extinguising the rights of the individual. I found that the only remedy for this is to separate the individual from the tribe and village, and fix in him an indefeasible right to a designated lot of land and to all that he can produce on it. . .(Annual Report 1879:25).

By 1881 Dougherty was able to report some 97 individuals living on allotments, with over 250 acres under cultivation. In addition, the Indians were beginning to take a serious interest in stock raising. While neither their agricultural efforts nor their attempts at ranching were wholly successful, particularly with the ever-present severe winters of Dakota, the agent was well satisfied with the progress towards "civilization" of his charges (Annual Report 1881:27-29).

The efforts of the Episcopal Church contributed to this "civilizing" process. The Reverent Hachaliah Burt arrived at Crow Creek in 1872, and continued to serve the Yanktonai until his death in 1915. Services were conducted in three chapels, one in the upper portion of the reservation, one at Fort Thompson, and one in the lower agency. Burt delivered his sermons in both English and Dakota (Annual Report 1881:32; Biller 1916:561-562; David W. Clark 1978:1).

Wizi, a prominent leader of the Yanktonai, appears to have been one of the initial advocates of acculturation at Crow Creek. An early convert to Christianity, he was married by Rev. Burt in a service at Fort Thompson. He adopted white-style dress, and was one of Dougherty's earliest allottees. When he was granted his lands in severalty he immediately deeded a small plot to the church for use as a cemetery. His prestige in the tribe surely induced many others to follow his course (Biller 1916:562; Annual Report 1879:26; U. S. Bureau of Indian Affairs 1895-).

Agent Dougherty also proudly pointed out another individual, Don't Know How, who:

> built a house at his own expense, opened a store, and has since increased his capital from $25 to something over $600. The [official] agency trader regards this as incontrovertable evidence of the fiendish and atrocious nature of the Indian ... (Annual Report 1879:26).

Dougherty later reported that Don't Know How had further multiplied his wealth "to the value of $2000". He lamented that, "like many of the most industrious Indians, [he] is still a heathen" (Annual Report 1880:26).

Suddenly, in 1885, all that Dougherty, Burt, and many others had worked for seemed in peril. On February 27 President Chester A. Arthur, with no warning to the inhabitants of Crow Creek, signed an executive order opening over two-thirds of the reservation to white settlement (Figure N-2). Homesteaders immediately rushed into the area, occupying lands which the Indians had cultivated.

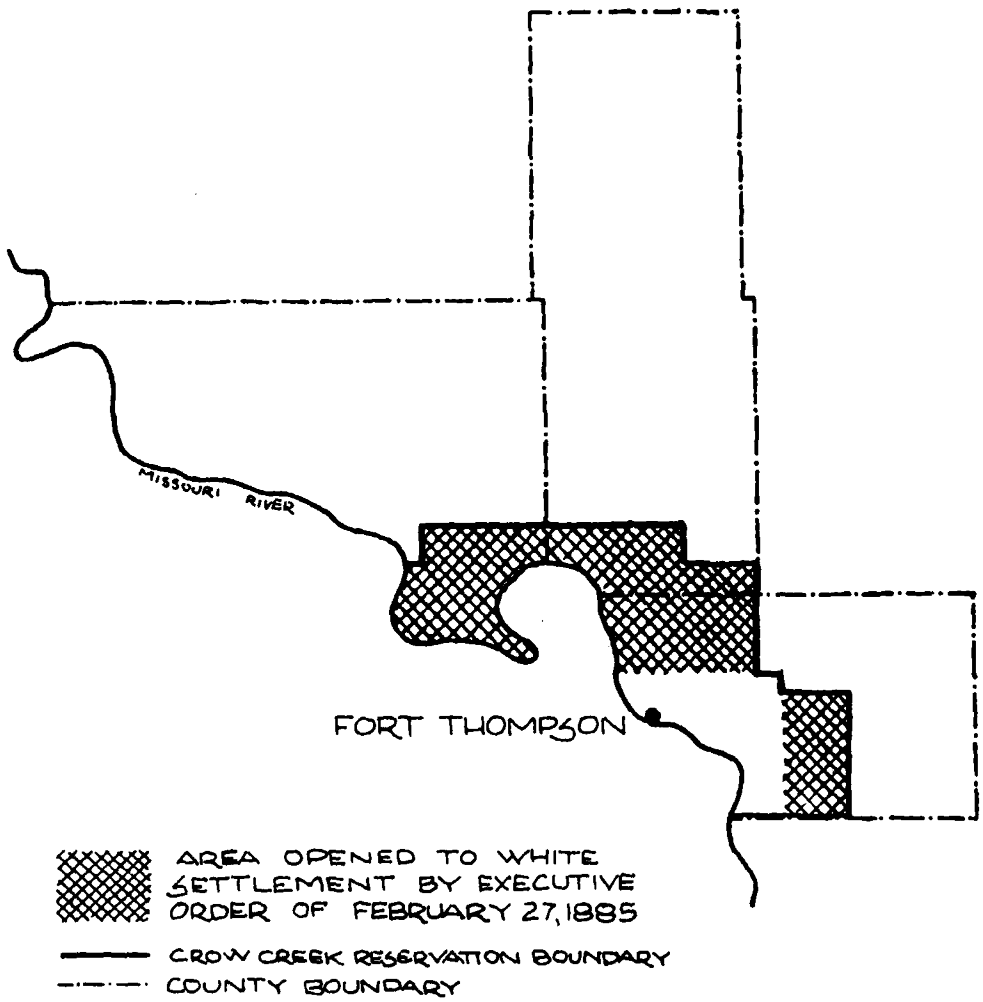

Figure N-2. Map of Crow Creek Reservation showing area opened to settlement by Executive Order of 27 February 1885.

On April 17, 1885, the new president, Grover Cleveland, proclaimed the order illegal, and continued:

> I, Grover Cleveland, President of the United States, do hereby declare and proclaim the said Executive Order of February 27, 1885, to be in contravention of the treaty obligations of the United States with the Sioux tribe of Indians, and therefore to be inoperative and of no effect; and I further declare that the lands intended to be embraced therein are existing Indian reservations and as such available for Indian purposes alone. . .(Richardson 1900:305-307; Annual Report 1885:LI-LII, 20).

Cleveland's proclamation informed "all and every person or persons now in occupation of said lands,. . .and all such person or persons as are intending or preparing to enter and settle upon the same", that it was illegal to enter or remain on reservation land. Those already settled were "required to vacate and remove therefrom with their effects within sixty days". Cleveland pledged "all the power of the Government" would be used to remove recalcitrant homesteaders (Ricahrdson 1900:306-307).

The Indians at Crow Creek, given the circumstances, reacted admirably. Their agent wrote that "the Indians have been sorely tried and tempted to resist the inroads of their white neighbors, and yet scarcely an act of resistance even has been reported" (Annual Report 1885:20).

Many of the white intruders refused to leave when ordered. Despite President Cleveland's promise of government intervention,

> . . .many of them still remain, building houses, breaking lands, and generally conducting themselves as if they intended to remain permanently, cutting and selling large quantities of wood and hay, utterly defying the authority of the agent, and threatening to resist the police (Annual Report 1885:20).

It was not until 1888, when a new agent assumed authority at Crow Creek, that the last of the illegal squatters were removed (Annual Report 1888:33).

White settlers were arriving in increasingly larger numbers in the surrounding area and, naturally, showed interest in obtaining reservation land. When the Indians began to receive patents on their allotments, and could legally sell their land, they found whites

willing buyers[6]. Some of the purchasers were merely seeking a small family farm; others were large scale farmers and ranchers adding to already large holdings. John Quinn Anderson, who knew the reservation well, purchased a tremendous amount of land from Indians on Crow Creek.

Anderson, a native of Missouri, arrived in Dakota Territory in 1882 at the age of 16. He worked at odd jobs as he could find them, eventually ending up buying and selling cattle. In 1894 he started a cattle ranch and some time later secured a government beef contract. In 1901 he became a bonded trader at Crow Creek. In the same year he was elected to the State legislature; he continued to serve in various governmental and political capacities into the 1920s. On Crow Creek reservation alone, between 1906 and 1926, he purchased over 18,500 acres (Robinson 1904:1475-1476, 1925:29).

The widespread sale of Indian lands, throughout the United States, alarmed some members of the government. A growing number of Indians were selling their property and quickly winding up landless and poverty stricken. Governmental policy decisions and legislation throughout the 1920s made it more and more difficult for the Indians to sell their land. While this may have worked temporary financial hardships on many people, it is possible that this concern is responsible for the preservation of many of the nation's reservations. The Yanktonai Dakota continue to occupy the majority of the land on Crow Creek reservation today.

SETTLEMENT IN THE BIG BEND

Settlement of the Dakota Territory picked up considerably as governmental policy extinguished Indian title to vast tracts of land and settled the bribes on formal reservations. European immigration was increasing steadily and many of the newcomers sought farmland on the Great Plains. As the population increased the territorial legislature created and organized county governments to maintain order in the burgeoning region.

Buffalo County was created in 1864--an enormous district with its northern border extending well into what is today North Dakota. Formal government was organized in 1871 (Table N-2). As settlers moved into the area in greater numbers the legislature found it necessary to provide services more efficiently; in 1873 they created twenty additional counties, among them Hughes and Hyde, within Buffalo County's boundaries. Hughes County was organized in 1881, Hyde in 1884 (Robinson 1925:100, 366, 369).

In the 1870s the Big Bend counties experienced major fluctuations in settlement, a pattern which would continue into the present. The region was solely agricultural and therefore at the mercy of nature. When harvests were good new settlers arrived to try their luck; when severe winters, or droughts, or swarms of grasshoppers, or all three, destroyed the crops the inhabitants often moved on to a more receptive climate. Other areas of the territory experienced much the same phenomenon. The results were mitigated only in those counties which boasted some degree of urban settlement; cities and towns, if they were conveniently located to serve a widespread area, could provide a degree of stability to the adjacent lands. But, in the closing years of the decade, the mineral wealth of the Black Hills introduced new considerations and altered the pattern of settlement in the Big Bend region.

Gold was first discovered in the Black Hills in August, 1874. Legally closed to white intruders as Indian lands, gold seekers nonetheless stole past army patrols into the area. By mid-1876, a full scale gold rush was in progress. Boom towns were cropping up, and miners required supplies. In the early years of the rush, stage and freight lines moved supplies from the nearest railroad towns, in Wyoming, Iowa, Nebraska, and South Dakota. Sioux City and Yankton shipped goods up the Missouri River to the town of Fort Pierre and, from there, overland into the Black Hills. Then, in 1877, the Chicago and North Western Railroad Company elected to extend a route from Tracy, Minnesota, to the Missouri River at Fort Pierre (Schell 1968:152-155, 161).

Table N-2. The Big Bend area of South Dakota: general information.

	BUFFALO COUNTY	HYDE COUNTY	HUGHES COUNTY	SOUTH DAKOTA
Created	1864	1873	1873	1861
Organized	1871	1884	1881	1861 (Statehood: 1889)
First settled	1863 (Fort Thompson)	1881	1872 (Pierre)	1850s
Named for	American Bison	James Hyde (Territorial Legislator)	Alexander Hughes (Territorial Legislator)	Dakota Indians
County Seat	Gann Valley	Highmore	Pierre	Pierre (State Capital)
CHARACTERISTICS (1910):				
Area (Square miles)	479	866	759	76,868
Population per square mile	3.3	3.8	8.3	7.6
Rural population per square mile	3.3	3.8	3.4	6.6
Number of families	368	746	1,492	131,060
Number of dwellings	368	738	1,419	127,739

Source: U. S. Department of Commerce, Bureau of the Census. Thirteenth Census of the United States Taken in the Year 1910. Vol. 3: Population, 1910: Nebraska-Wyoming. Washington: Government Printing Office, 1913.

THE CITY OF PIERRE

A small village existed across the river from Fort Pierre in 1878. Witn the news of the projected railroad line, the prospects of this hamlet increased immeasurably. The name was changed from Mato (Sioux for Bear) to Pierre, and speculators prepared to cash in on the impending boom (Robinson 1925:587; Lamar 1956:177-178).

The railroad line was completed in 1880 and supplies for the Black Hills quickly traveled from Minnesota to Pierre, were ferried across the river to Fort Pierre, and freighted overland. Pierre remained a dominant link in the supply routes to western Dakota until 1886, when the Chicago and North Western opened a line from Nebraska to Rapid City. Even then, stripped of her importance as a freighting center, the city continued to serve the Big Bend region, moving crops to market and providing the commodities the local inhabitants required (Mattison 1962:34; Schell 1968:162-163).

The Black Hills gold rush brought thousands of newcomers into Dakota. Though many moved on as the gold fever subsided, a significant number settled permanently. The rail lines, extended into the area during the gold rush, made shipment of crops to market easier, and encouraged settlement in the once remote reaches of the territory. With the rise in population, the first proposals for statehood were heard (Lamar 1956:193).

The increased settlement in the northern portion of the territory raised a point of contention. The territorial capital was located in Yankton, on the southern border of Dakota. Many of the citizens of the northern counties favored a more central location for the seat of government; indeed, there was growing sentiment for dividing the territory into two separate units. In 1883, following months of intense political maneuvering, a bill passed the legislature relocating the capital at Bismark. The north was molified, but the question of division remained unsettled (Lamar 1956:206-208; Schell 1968:208-211).

The 'pro-division' forces won final victory on February 22, 1889, when President Cleveland signed the Omnibus Bill creating

four new states: Montana, Washington, and North and South Dakota. In October, the citizens of South Dakota approved a new constitution and selected Pierre as the temporary capital. The newly elected President, Benjamin Harrison, signed the documents formally admitting North Dakota and South Dakota on November 2, 1889 (Schell 1968: 219-222).

Although Pierre was not intended to be the permanent location of the state capital, it has maintained that distinction. The opportunities for employment, and the auxiliary business prospects of a capital city, insured Pierre's future. The city, and the surrounding communities, generated a sporadic but determined growth. The opening of a highway bridge and a railroad line across the Missouri River in the early years of the twentieth centure, linking Pierre to the western ranch country, added to the importance of the city. The construction of Qahe dam, begun in 1948 and completed in 1964, opened a new period of prosperity in the region, and contributed to the almost doubling of Pierre's population in the 1960s (Mattison 1962:34-35).

THE BIG BEND REGION IN PERSPECTIVE

AGRICULTURE AND POPULATION FLUCTUATION

As with all of South Dakota, the Big Bend region depends on ranching and farming for its livelihood. In the territorial years settlement was at the mercy of nature. If the weather was good, and insect damage light, the farmers thrived; the population grew as others came to take advantage of the bounty. When elements combined to destroy crops, the farmers, often bankrupted by the experience, moved on. In the twentieth century the situation became more complex. Technology served the farmer and helped him to overcome, to some extent, the whims of nature. At the same time, the ability to produce more and more on the same land, and the attendant costs of technological farming, drove many small

farmers out of business. Agriculture became an industry, and corporate interests began to dominate the field. A general consideration of population statistics demonstrates the effects of this dominance: in the twentieth century South Dakota has experienced moderate growth--only in the censuses of 1940 and 1970 did the population of the state decline--and consistent urban growth (Table N-3). But the rural populace has steadily declined since 1940[8].

Age and sex patterns provide additional clues in the study of South Dakota and the Big Bend region. In the United States as a whole, increased longevity and declining infant mortality is apparent, and there is a distinct tendency towards balance of males and females throughout the age groups. South Dakota exhibits the same characteristics although the age distribution is slightly different, particularly in recent years: the state's percentage of 5 to 19 year olds is higher than the national average, consequently, ages 20-64 are under-represented. This tendency is even more pronounced in data for the Big Bend counties alone. The reasons become clear when the data is broken down into components of the population--urban, rural, non-farm, and urban farm inhabitants. Data on native whites in South Dakota, the majority of the population, shows that the urban dwellers vary slightly from national averages, but the rural population exhibits markedly different characteristics. Rural non-farm dwellers are slightly below state norms in most age categories through age 64; but in the 65 and over bracket, they are far more heavily represented--almost double the national figure. This may well indicate a preference for rural small town life among senior citizens, as well as a longer life span in such surroundings.

It is, however, in the rural farm population figures that the dominant tendency in South Dakota's population trends is found. Children from 5 to 19 are represented in percentages far above national trends, but from age 20 through 29, at a time when they are becoming adults and seeking their own livelihood, both men and

Table N-3. Population fluctuation in the Big Bend area, South Dakota, with percent increase/decrease for decennial census years.

YEAR[1]	BUFFALO COUNTY		HYDE COUNTY		HUGHES COUNTY		SOUTH DAKOTA	
	Population	% +/-	Population	% +/-	Population	% +/-	Population	% +/-
1890	993		1,860		5,044		328,808	
1895	714		1,333		3,180			
1900	1,790	+ 44.5	1,492	- 19.8	3,684	- 27.0	401,570	+ 15.2
1905	639		1,822		3,902			
1910	1,589	- 12.6	3,307	+121.6	6,271	+ 70.2	583,888	+ 45.5
1915	1,435		2,605		5,055			
1920	1,715	+ 7.9	3,315	+ 0.2	5,711	- 8.9	636,547	+ 9.0
1925	2,241		4,000		6,860			
1930	1,931	+ 12.6	3,690	+ 11.3	7,009	+ 22.7	692,849	+ 8.8
1940	1,853	- 4.0	3,113	- 15.6	6,624	- 5.5	642,961	- 7.2
1950	1,615	- 12.3	2,811	- 9.7	8,111	+ 22.4	652,740	+ 1.5
1960	1,547	- 4.2	2,602	- 7.4	12,725	+ 56.9	680,514	+ 4.0
1970	1,739	+ 12.4	2,515	- 3.3	11,632	- 8.6	665,507	- 2.2

[1]Mid-decade population data not available for South Dakota, nor for the counties after 1925; fluctuation percentages are for the decennial years only.

Sources: Decennial data from the U. S. Bureau of the Census, Census of Population (Washington: Government Printing Office, 1890-1970). Mid-decade data from Doane Robinson, Doane Robinson's Encyclopedia of South Dakota (Pierre, S. D.: by the author, 1925), p. 990.

women are in a distinct minority on the farms. It is obvious that young adults in South Dakota are leaving the farms to seek careers in the cities and out of state. The declining financial dividends of the small farmer and rising land costs must certainly play a role in this out-migration. This being the case, it would seem that agriculture will become more and more the province of corporate concerns who can allay the financial burden and reap the rewards; as a basis of financial support, through taxation and employment, agriculture will always be important to South Dakota. But for the new generations of the state, the cities will provide the jobs and the opportunities.

For the Big Bend region, where all of these trends are accentuated due to the dominance of agriculture, this probably means a continuing decline in population. If Pierre can sustain her role as a business center, in addition to her governmental functions, perhaps the city will continue to grow. But without the introduction of new opportunities for the coming generations, the Big Bend region, and all of rural South Dakota, is seemingly destined for an increasing decline in population and, hence, importance and influence.

SUMMARY AND CONCLUSIONS

The Big Bend region played an important, if often unrecognized, role in the history of South Dakota and the Great Plains. In the region itself, four major elements have served to shape and define its character and history:

- the Missouri River
- military-Indian occupation
- location of the state capital at Pierre
- dominance of agriculture

THE MISSOURI RIVER

From the earliest years, through the mid-nineteenth century, the Missouri River provided an important transportation source for the Big Bend region. The location of Crow Creek reservation, Fort Pierre, Fort Sully and, later, Pierre, all depended in some degree on the river. These communities and outposts attracted additional settlement and added stability to the area.

The Missouri River was crucial to the settlement of the Big Bend region. Explorers and fur trappers depended on the river for transportation. As the military extended its influence across the Plains, the river was a necessary link in communication and supply networks. Early settlers also found the Missouri the most convenient way to ship and receive commodities. The extension of the railroads, in the 1880s, into the territory reduced river traffic substantially, and the Missouri's importance was diminished until the mid-twentieth century. With the development of the Pick-Sloan Plan, beginning in the 1940s, the river took on a new role, that of providing water and power to the desolate reaches of the Plains. Big Bend dam and Oahe dam have revitalized the Big Bend region, providing jobs as well as necessary utilities to the citizens of Hughes, Hyde, and Buffalo counties.

MILITARY-INDIAN OCCUPATION

The early military occupation of the Big Bend region helped to focus attention on, and attract settlers to, the area. Fort Sully, during its short life from 1863 through 1866, helped to secure the territory for civilian settlement. The establishment of Crow Creek reservation had a dichotomous effect: the relocation of hundreds of Indians in the area served to make prospective settlers nervous, yet the reservation offered, from the Government's point of view, opportunities to those willing to take the risks. After the first disasterous years, agricultural successes at Crow Creek demonstrated the area's capabilities.

Removed to the north in 1866, Fort Sully, along with Fort Randall to the south and occasional military garrisons at Fort Thompson, calmed the settlers' fears. The need for suppliers, both to the army and the Indians, offered economic opportunities and established the first businesses in the Big Bend region.

THE STATE CAPITAL AT PIERRE

The Black Hills gold rush, and the extension of the Chicago and North Western Railroad across eastern Dakota in 1880, turned a minor hamlet into a booming freighting center. The city of Pierre grew and, although the gold rush declined and newer railroad lines served western Dakota more efficiently, maintained its importance as a trade center for central Dakota. Selected as the temporary capital of South Dakota at the time statehood was declared, the city has held on to that distinction. The concentration of political functions brought with it additional business opportunity and insured a degree of economic stability to the Big Bend region which agriculture alone could not provide. Presently, the decline of the rural population throughout South Dakota, and the consistently increasing urban population, places added importance on Pierre's role in the future of the Big Bend region.

AGRICULTURE IN THE BIG BEND

When Clark W. Thompson selected the site for Crow Creek reservation, and the first few acres were plowed, the agricultural foundation for the Big Bend region was laid. Although the initial efforts of the Santee Sioux and the Winnebagoes were unsuccessful, perseverance and determination, together with advancing agricultural technology, won out.

The Big Bend region was, and still is, primarily farm and ranch land. The consolidation of small family farmsteads into larger and larger units, and the resulting decline in rural population,

signaled some basic changes in the role of the Big Bend region. While agriculture will undoubtedly continue as the major function of the area, employment opportunities for the communities' youth are limited. Census data reveals that the young people, in the Big Bend region and in South Dakota as a whole, are either settling in the cities or leaving the state altogether. Thus, while the rural areas will still provide agricultural commodities to the nation, it is in the urban centers that the majority of the area's people will be employed. A common phenomenon in many states, it is a new trend in South Dakota. The ability to adjust to this trend, and attract the businesses which will provide the jobs, will determine both Big Bend's and South Dakota's future.

NOTES

[1]A. P. Nasatir (1952:33-34) makes no mention of the plate.

[2]See Schell (1968:29, note) for a brief discussion of the difficulties in translating the plate; another translation can be found in Mattison (1962:36-37). The plate is currently on display in the museum of the South Dakota State Historical Society.

[3]Much of the discussion of Fort Atkinson and the Atkinson-O'Fallon expedition is based on this article and Johnson (1956: 121-133, 1959:1-38) and Nichols (1965:65-67).

[4]Edmund J. Danziger, Jr., claims that greed for the Winnebagoes' land "provided a strong motive for their expulsion" (1970:115).

[5]A slightly different quotation of Drips' description is found in Robinson (1904:215-216).

[6]Land sales are recorded by the Bureau of Indian Affairs, U. S. Department of the Interior (1895).

[7]Johnston (1948) provides a thorough discussion of the so-called Dawes Act and its impact on the reservations of South Dakota (see especially pp. 76-104, 123-127).

[8]Much of the discussion of settlement trends is derived from evidence in the decennial census reports. U. S. Census Office, 1896, 1913, 1943A, 1943B, 1952, 1971, 1972, 1976. Support data are on file with the Division of Archeological Research, University of Nebraska-Lincoln.

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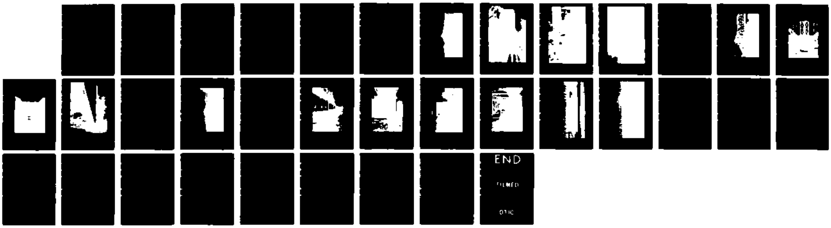

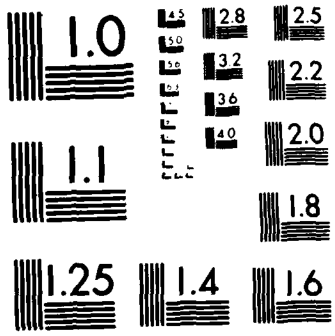

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VOLUME III
APPENDIX 1

ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

SECTION O

ARCHITECTURAL REPORTS: PIERRE AND FORT PIERRE RAILWAY BRIDGE (CHICAGO AND NORTH WESTERN RAILWAY): OLD U. S. HIGHWAY 14 BRIDGE

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APPENDIX 1, SECTION 0

ARCHITECTURAL REPORTS: PIERRE AND FORT PIERRE RAILWAY BRIDGE (CHICAGO AND NORTH WESTERN RAILWAY): OLD U. S. HIGHWAY 14 BRIDGE

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ARCHITECTURAL REPORTS: PIERRE AND FORT PIERRE RAILWAY BRIDGE (CHICAGO AND NORTH WESTERN RAILWAY): OLD U. S. HIGHWAY 14 BRIDGE

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PIERRE AND FORT PIERRE RAILWAY BRIDGE
(CHICAGO AND NORTH WESTERN RAILWAY)
MISSOURI RIVER AT PIERRE, SOUTH DAKOTA

DESCRIPTION

The Chicago and North Western Railway bridge across the Missouri River at Pierre, South Dakota (Figure O-1) was built in 1906-1907 connecting the State Capital to Fort Pierre in Stanley County. The bridge is composed of five long through truss spans with two deck approach spans at each end. Not remarkable for railroad bridges of its time, the C and N W structure nonetheless exists as a representative bridge of its type.

The river spans of the bridge are approached from each end with deck spans (Figures O-2 and O-3). At the east both spans are of steel girder type. These are supported by an abutment at the easternmost support and by concrete caisson type piers at the other two ends. The pier which carries the east end of the first through truss, like the majority of the piers, is faced with stone while the center pier is smooth finished concrete (Figure O-4). The approach spans at the west end are of two types. The river side span is of the steel girder deck type and was constructed by Lassig Bridge and Iron Works of Chicago, Illinois in 1897. It is not known whether or where this span was used originally. It is supported on the river side by a rock faced concrete caisson pier which, as described above, is the major pier type for the bridge (comprising seven of ten total). The opposite support is of the multiple wood piling type (Figure O-1). The land side approach is a simple wood girder deck span which is supported by the abutment on the west. An intermediate support pier is of a more simple multiple wood piling type.

Figure 0-1. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. General view from the east bank, looking northwest. Photo: D. Murphy.

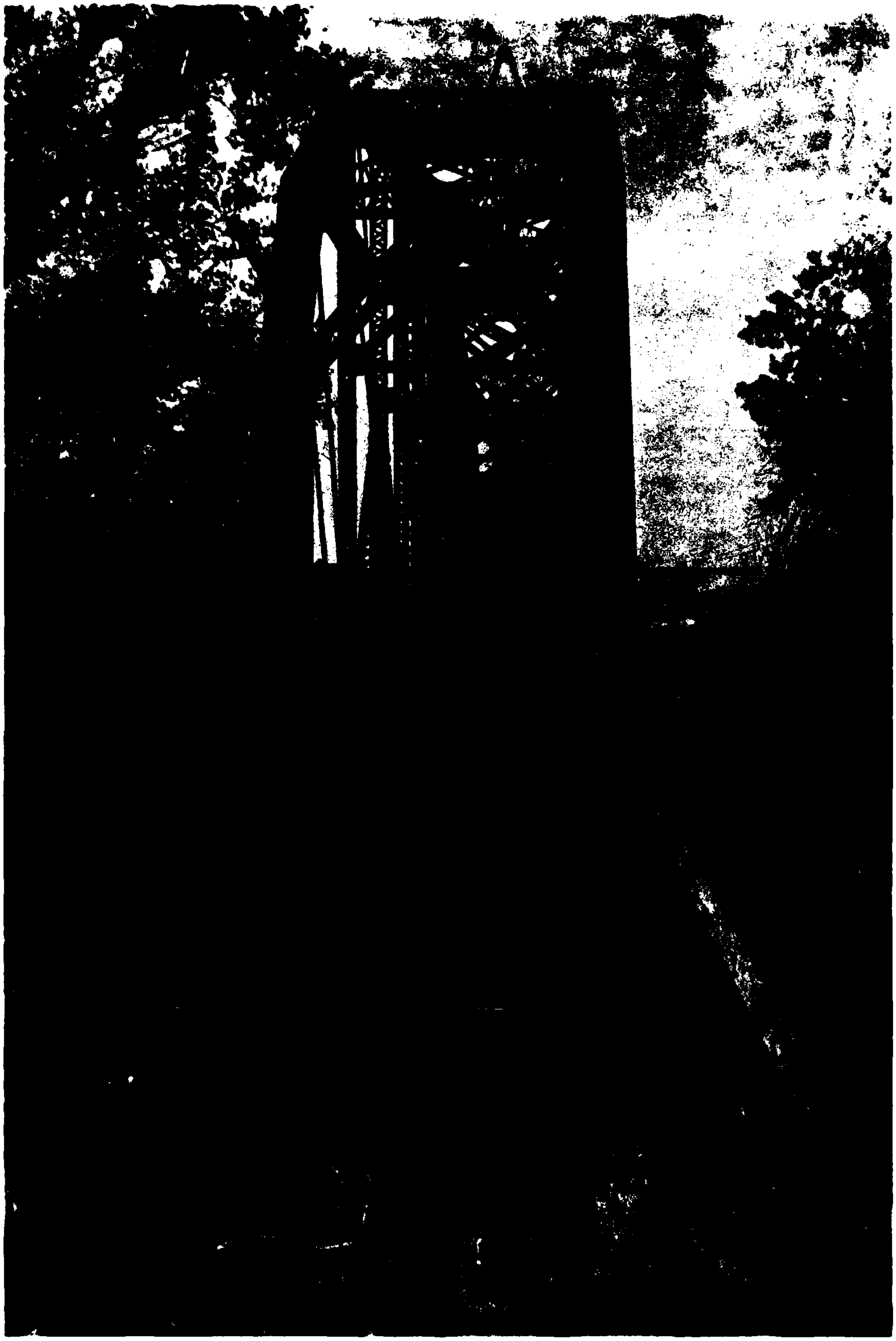

Figure 0-2. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. General view from the approach span of the east bank, looking west. Photo: D. Murphy.

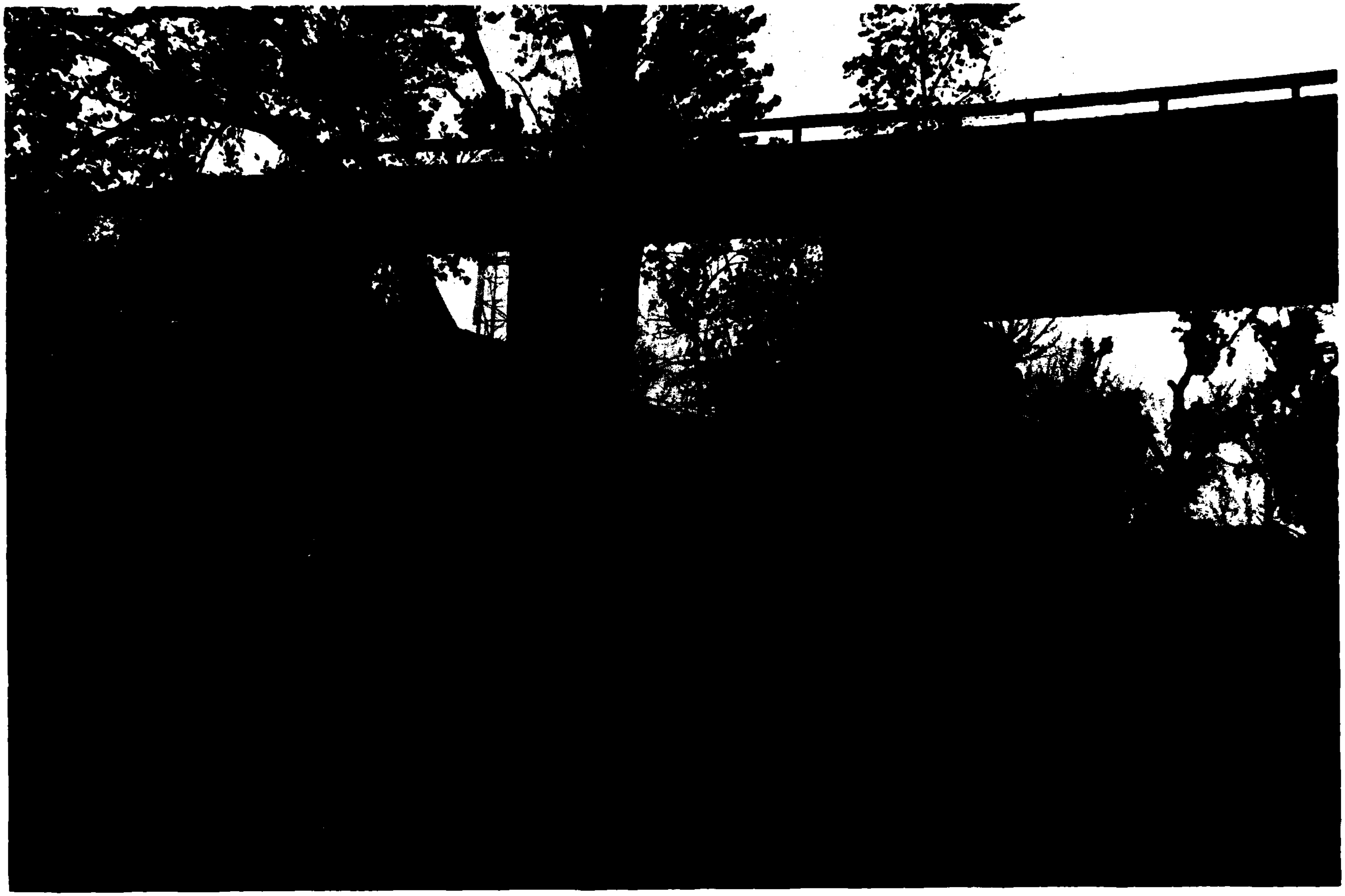

Figure 0-3. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. Detail view of west approach spans, looking north. Photo: D. Murphy.

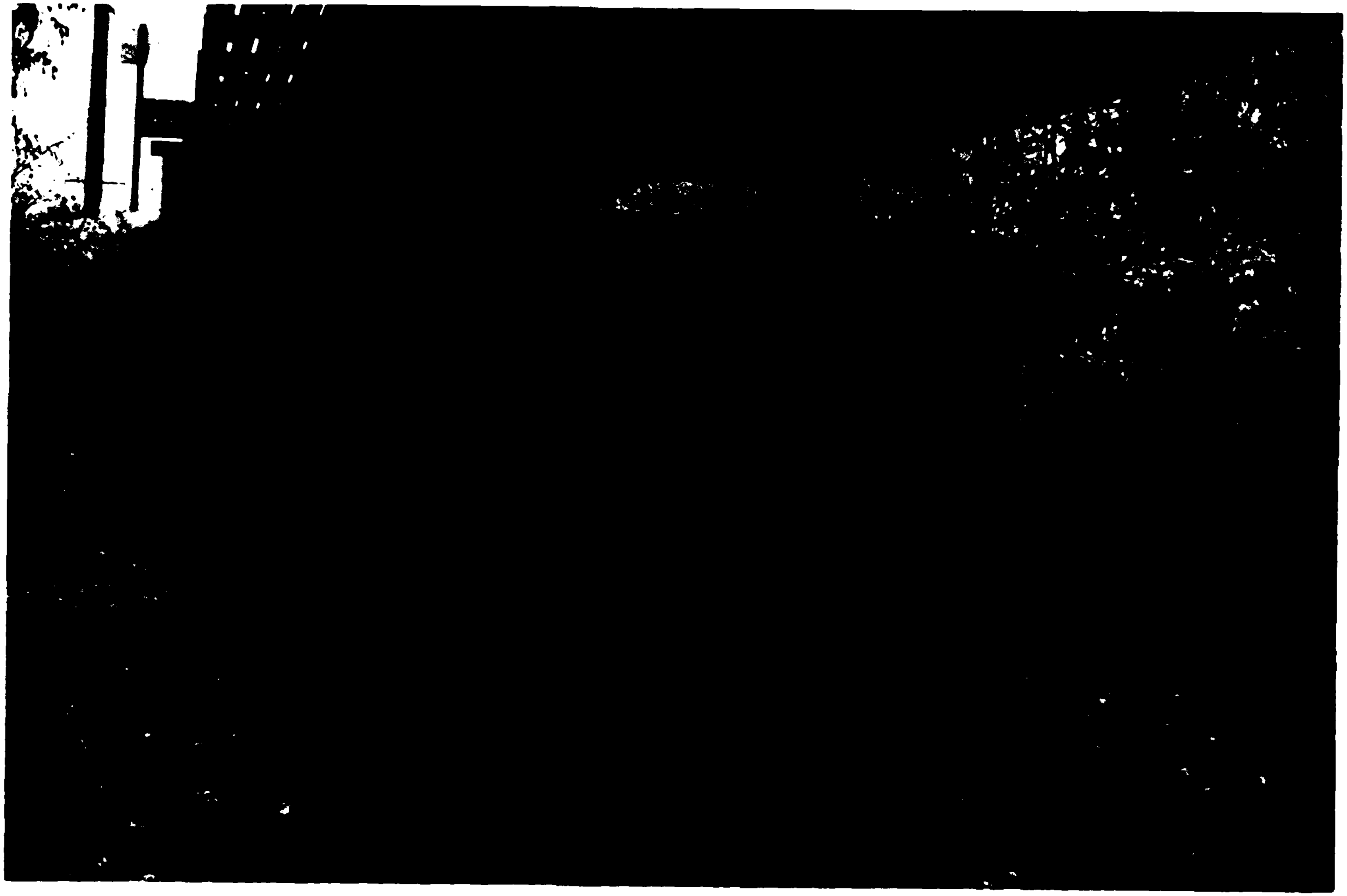

Figure 0-4. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. Un-faced concrete caisson pier at east approach span, looking east. Photo: D. Murphy.

The five river spans are all steel through trusses--four of the subdivided Pratt type and the fifth, a cantilever swing span. The four fixed spans are basically simple Pennsylvania through trusses except the center two panels have full-length intermediate horizontal struts. These spans were built by the Pennsylvania Steel Company, Steelton, Pennsylvania in 1906. The spans are each 350 ft. long (Chicago & North Western 1906,p. 21). The clear height of the span above mean high water was 17.9 ft. at the time of construction (Gee 1927), however, the raised water level of the Big Bend reservoir has resulted in a lower present clear height.

The channel span of the C and N W bridge is the through truss swing section located at the second river span from the east (Figure 0-5). Carried on a rock faced concrete drum pier (Figure 0-6), the symmetrical truss spans a clear width of 210 ft. on each side (Gee 1927) resulting in an overall length of 445 ft. (Chicago & North Western 1906). A three-tiered diagonally braced superstructure rises from the drum pier which acts as the internal support for the cantilever action when the swing is open. Each half of the swing span is composed of subdivided Pratt trusses which act as part of the cantilever when required. When the swing is closed (Figure 0-7) the span appears to act as two assymmetrical Pratt trusses. A protection pier of rock faced concrete is still extant on the upstream side of the pivot pier (Figure 0-8). The total length of this bridge, from center to center of its end piers, measures 1864 ft. (Chicago & North Western 1906).

SIGNIFICANCE

The present Chicago and North Western Railway bridge at Pierre is significant as the original railroad span of the Missouri River at this point (Mss: Missouri River; Gee 1927) and as a good example of the bridge type most commonly used during this period for railroad construction (Condit 1961:82).

The structure was built by the Pierre and Fort Pierre Bridge Railway Company to form a link between the Dakota Division of the

Figure 0-5. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. Detail view of the swing span, looking northwest. Photo: D. Murphy.

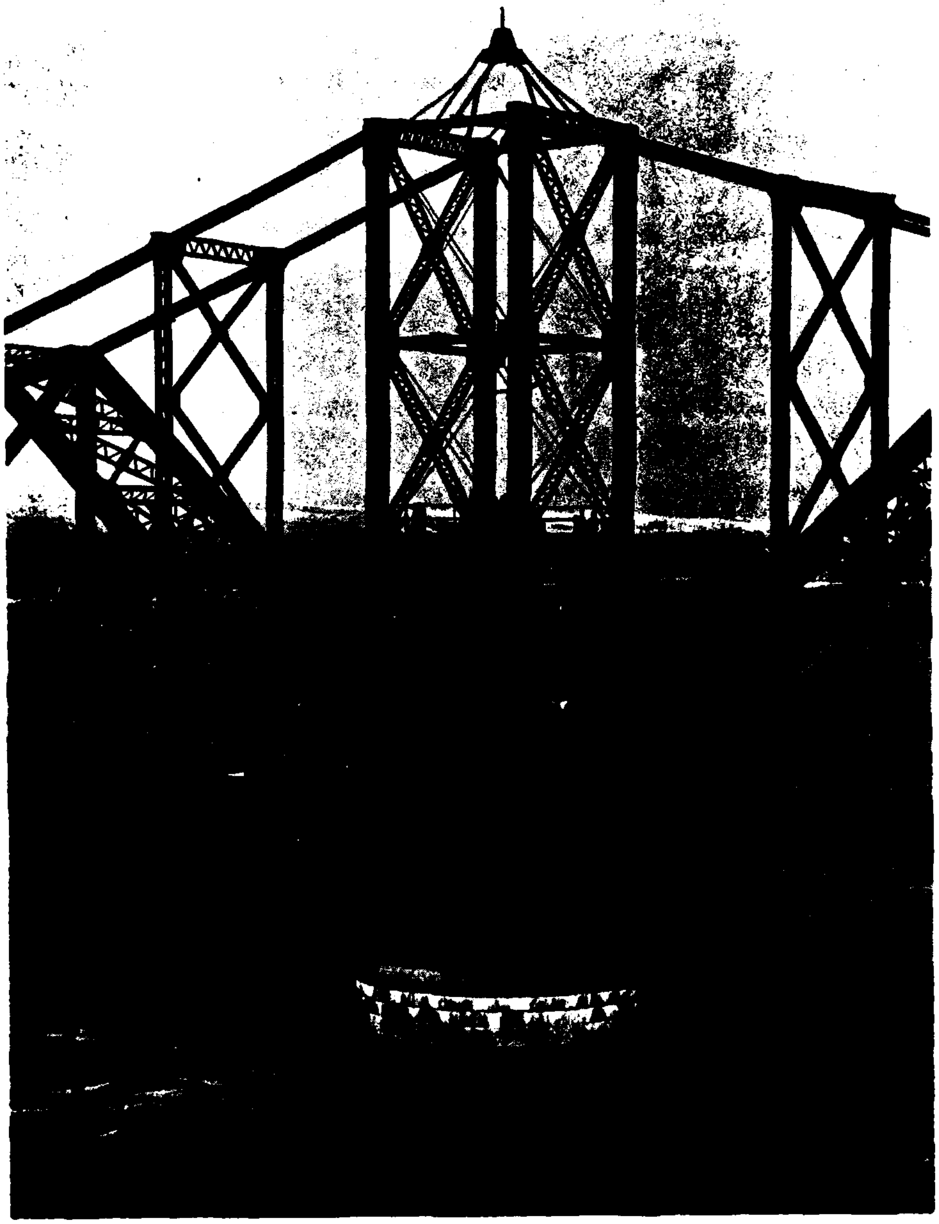

Figure 0-6. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. Detail view of the swing pier, looking northwest. Photo: D. Murphy.

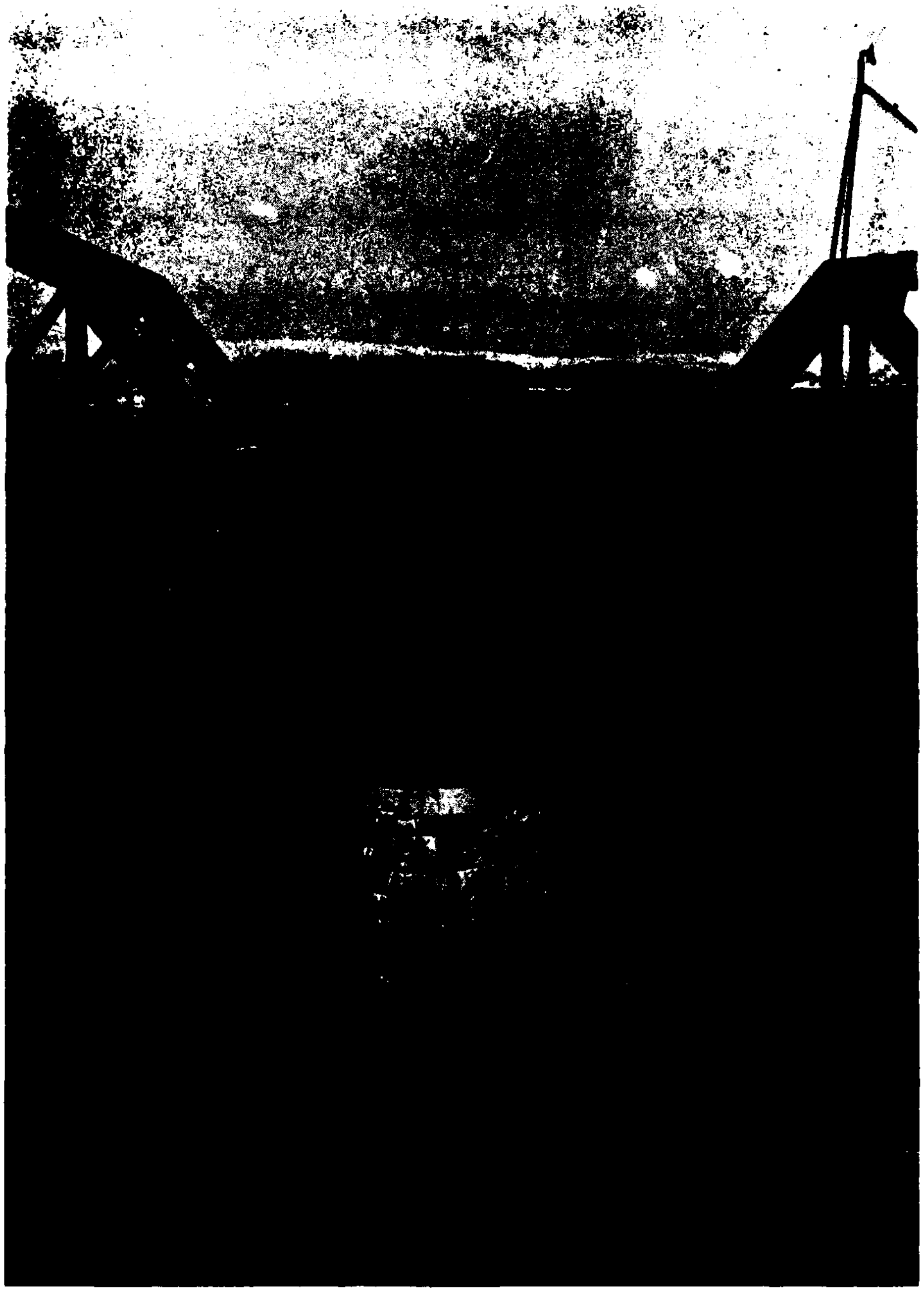

Figure 0-7. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. Detail view of pier at west end of swing span, looking north. Photo: D. Murphy.

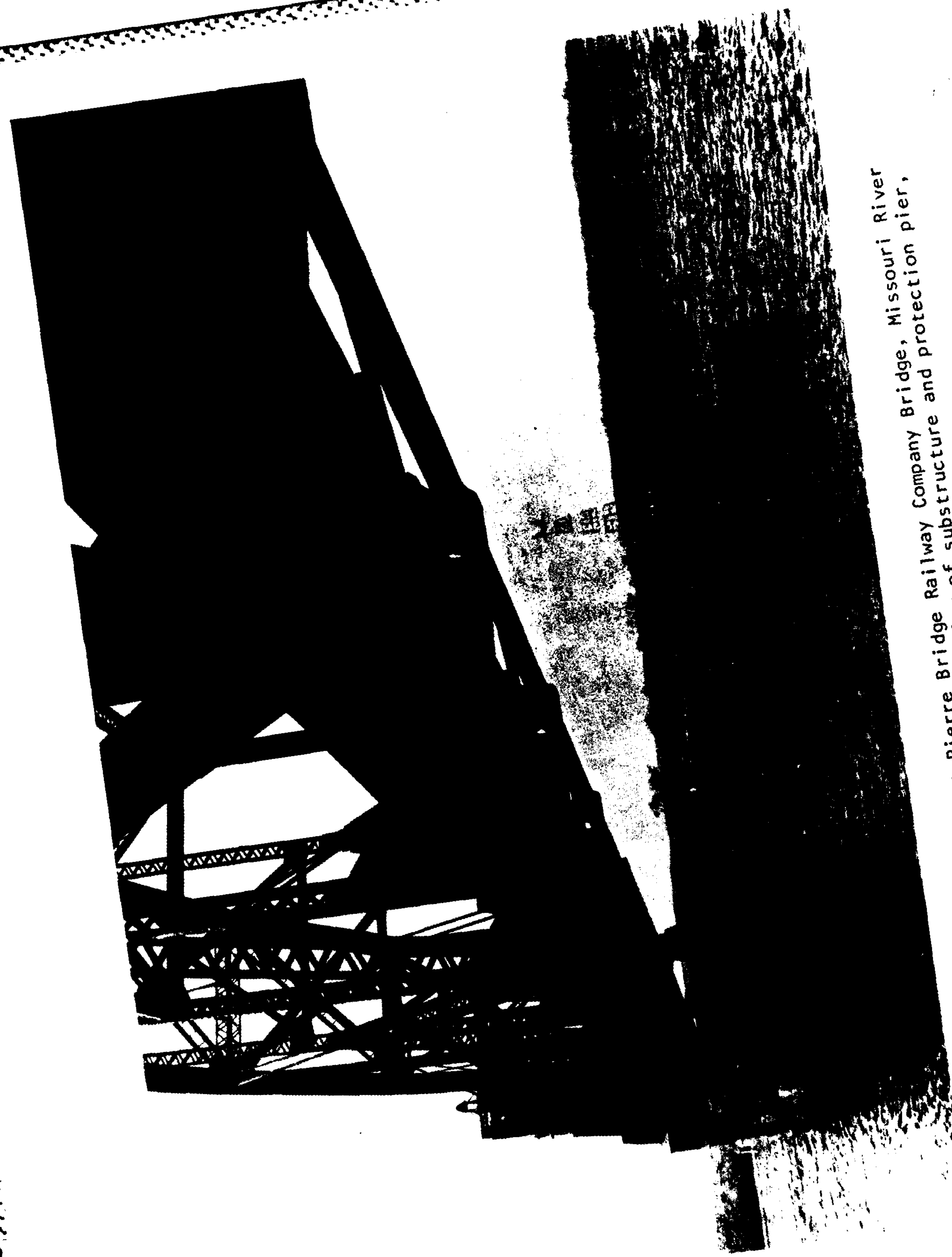

Figure 0-8. Pierre and Fort Pierre Bridge Railway Company Bridge, Missouri River at Pierre, South Dakota. View of substructure and protection pier, looking west-northwest. Photo: D. Murphy.

Chicago and North Western Railway in Pierre and the Pierre, Rapid City and North Western Railway at Fort Pierre across the Missouri in Stanley County (Chicago & North Western 1906). One of three contemporary original rail crossings of the river in South Dakota, this is the only one built by the North Western which was part of an effort to make such crossings between Bismarck, North Dakota and Sioux City, Iowa (North Western Line Railway 1897; Gee 1927). The crossing here and those made at Chamberlain (1906) and Mobridge (1908), both in South Dakota (Gee 1927), can be considered important to the settlement and establishment of trade in western South Dakota.

The Pierre bridge represents an excellent local example of the simple truss span bridge which was dominated by the Pratt and Warren trusses from their popular acceptance in the late nineteenth century through the final phase of railroad expansion (Condit 1961: 82). The bridge is, however, earlier and composed of longer fixed spans than that built by the Chicago and North Western over the Mississippi at Clinton, Iowa (1907-09). The longest fixed span of the Clinton bridge was 204 ft. while its longest span, the swing span, measured 463 ft., some 18 ft. longer than the Pierre swing span (Condit 1961:83, n.1).

The use of the swing span is represented in about half of the railroad spans across the Missouri River during this period (Mobridge, Chamberlain and Pierre, South Dakota, 1908, 1907 and 1907; Omaha, Nebraska, 1905; St. Joseph, Kansas City and Booneville, Missouri, 1904, 1917 and 1896--Gee 1927). Additionally, it should be noted that the swing span lends a certain aesthetic distinction to the Pierre bridge.

OLD U.S. HIGHWAY 14 BRIDGE
MISSOURI RIVER AT PIERRE, SOUTH DAKOTA

DESCRIPTION

The old U. S. Highway 14 (South Dakota #34) bridge over the Missouri River at Pierre, South Dakota (Figure 0-9) was authorized

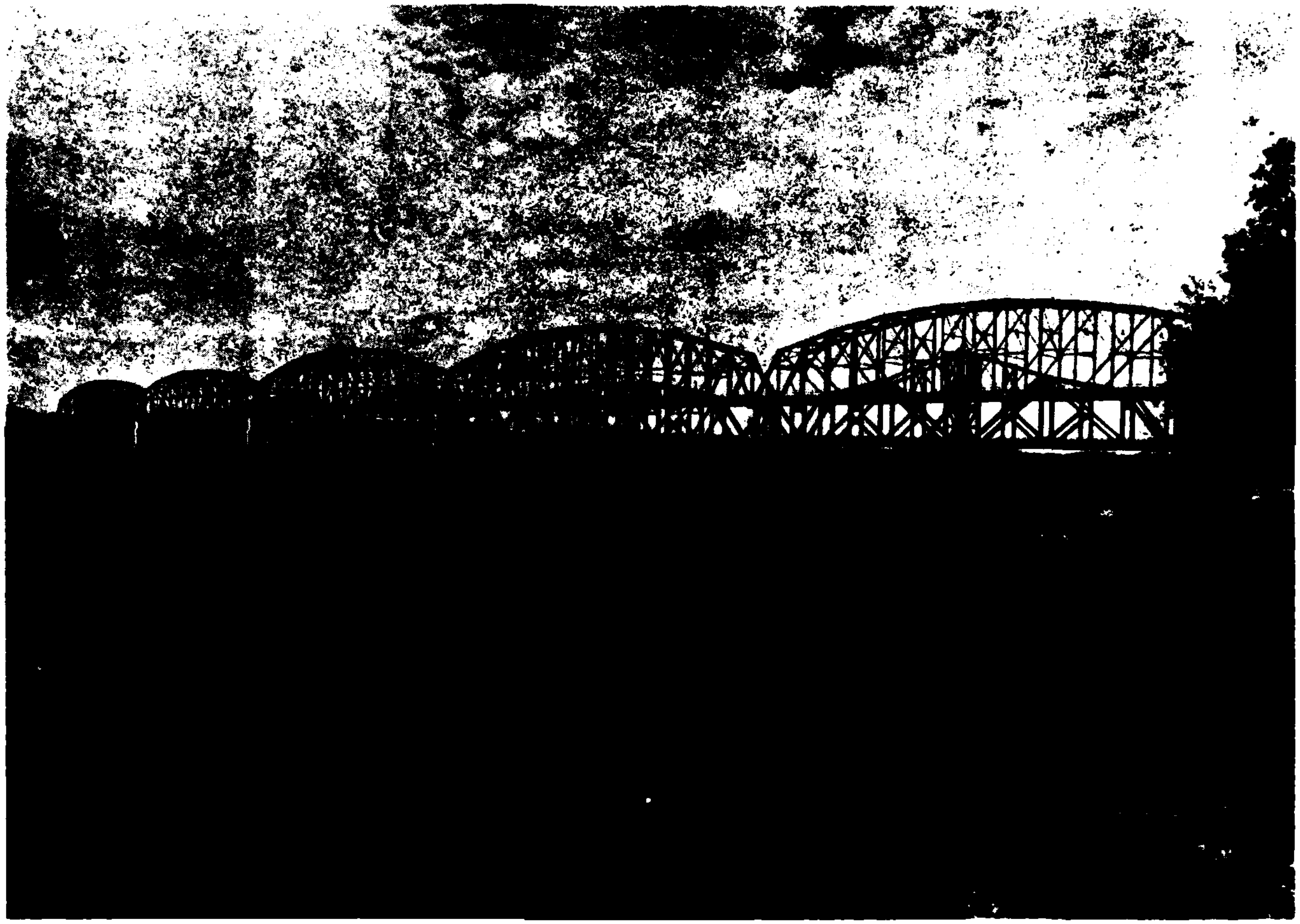

Figure 0-9. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. General view from the east bank, looking northwest. Photo: D. Murphy.

by Congress April 17, 1924 and completed in 1926. Located about 200 ft. south of the earlier Chicago and North Western Railway bridge (1906), this highway structure is comprised of six through truss spans with four deck approach spans at each end.

The bridge is supported throughout by concrete piers, each of a post and beam configuration above the water (Figure O-10). The short deck approach spans at each end are supported by lighter concrete piers (Figure O-11). The deck of the approach spans is a continuation of that supported by the through trusses and is a steel girder and joist structure topped with a concrete slab (Figures O-12 and O-13).

The main river spans are steel through trusses of a complex subdivided Pratt type (Figures O-14 and O-15). All panels have an intermediate vertical post with most panels complete with double full-length diagonals. Half-length intermediate horizontal struts are utilized in all panels except the center which is full-length. The panels adjacent to those at the ends are of the more common subdivided Pratt type with a half-length intermediate horizontal strut and half-length diagonal sub-ties.

The longest of the two channel spans supports a clear length of 330 ft. while the shorter measures 294 ft. Clear height above mean high water was 38 ft. at the time of construction (Gee 1926) but is presently lower due to the Big Bend reservoir.

The bridge has been replaced by a new structure several hundred feet to the south and is presently abandoned.

SIGNIFICANCE

The highway bridge at Pierre is significant as a representative example of its type. Additionally, the bridge was the first to provide secure non-rail traffic across the Missouri River at this location.

The bridge was authorized in 1924 at the beginning of a tremendous surge in highway construction established to meet the

Figure O-10. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. View showing the river piers, looking west. Photo: D. Murphy.

Figure O-11. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. View showing approach span piers, looking east. Photo: D. Murphy.

Figure 0-12. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. View from the east (Pierre) approach, looking west. Photo: D. Murphy.

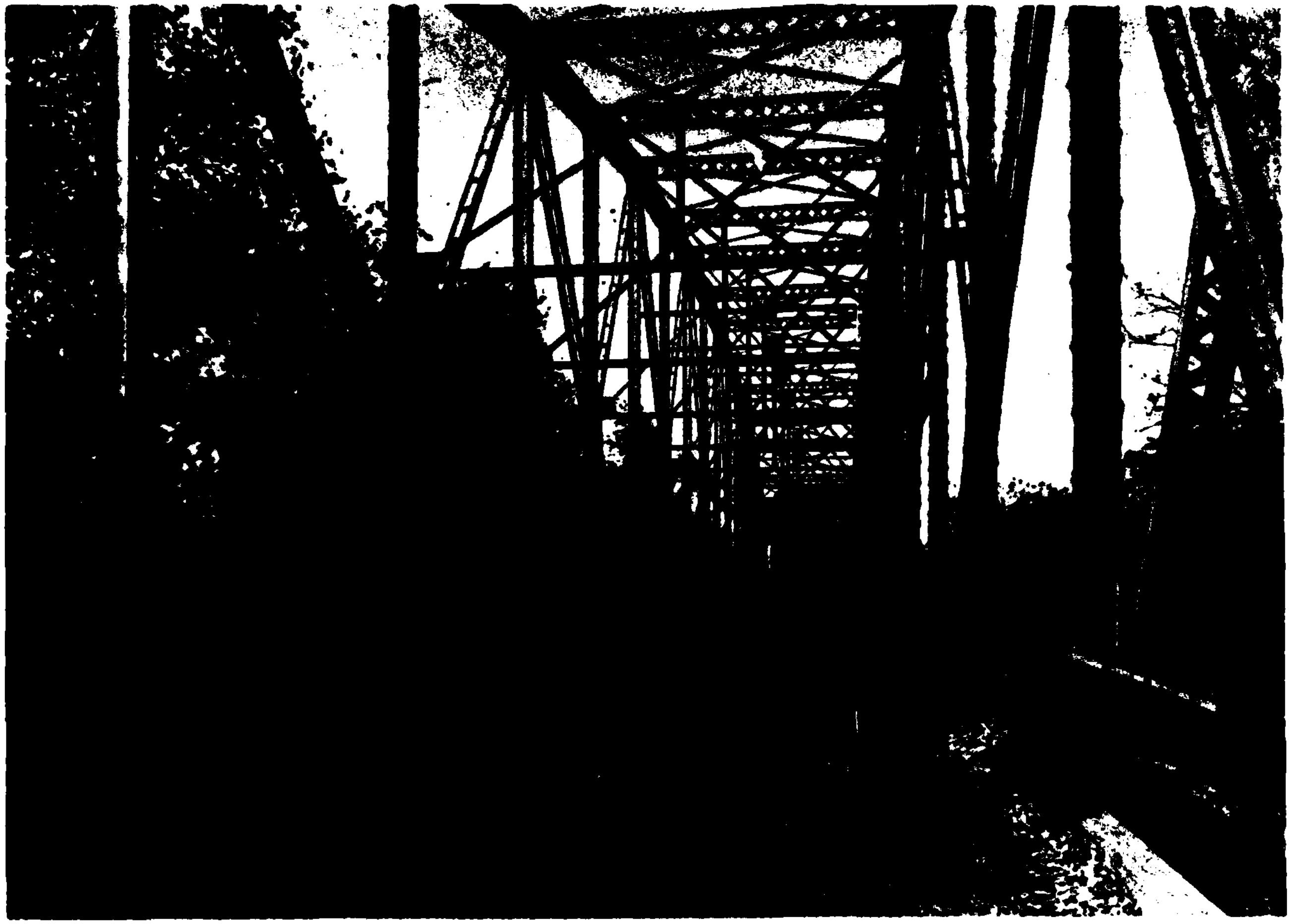

Figure 0-13. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. View from the deck, looking west. Photo: D. Murphy.

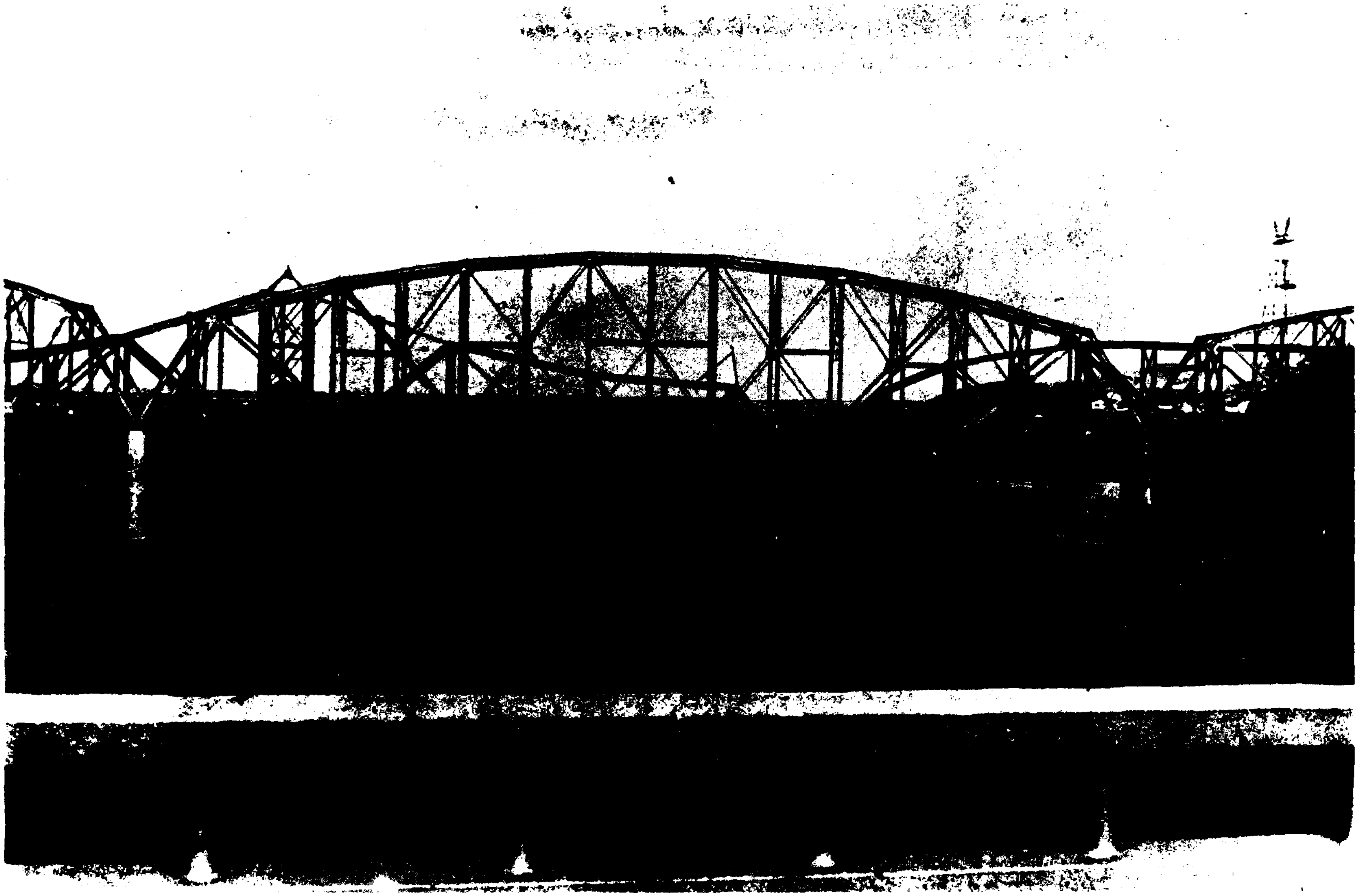

Figure O-14. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. Detail view of one of the short through truss spans near the east bank, looking north. Photo: D. Murphy.

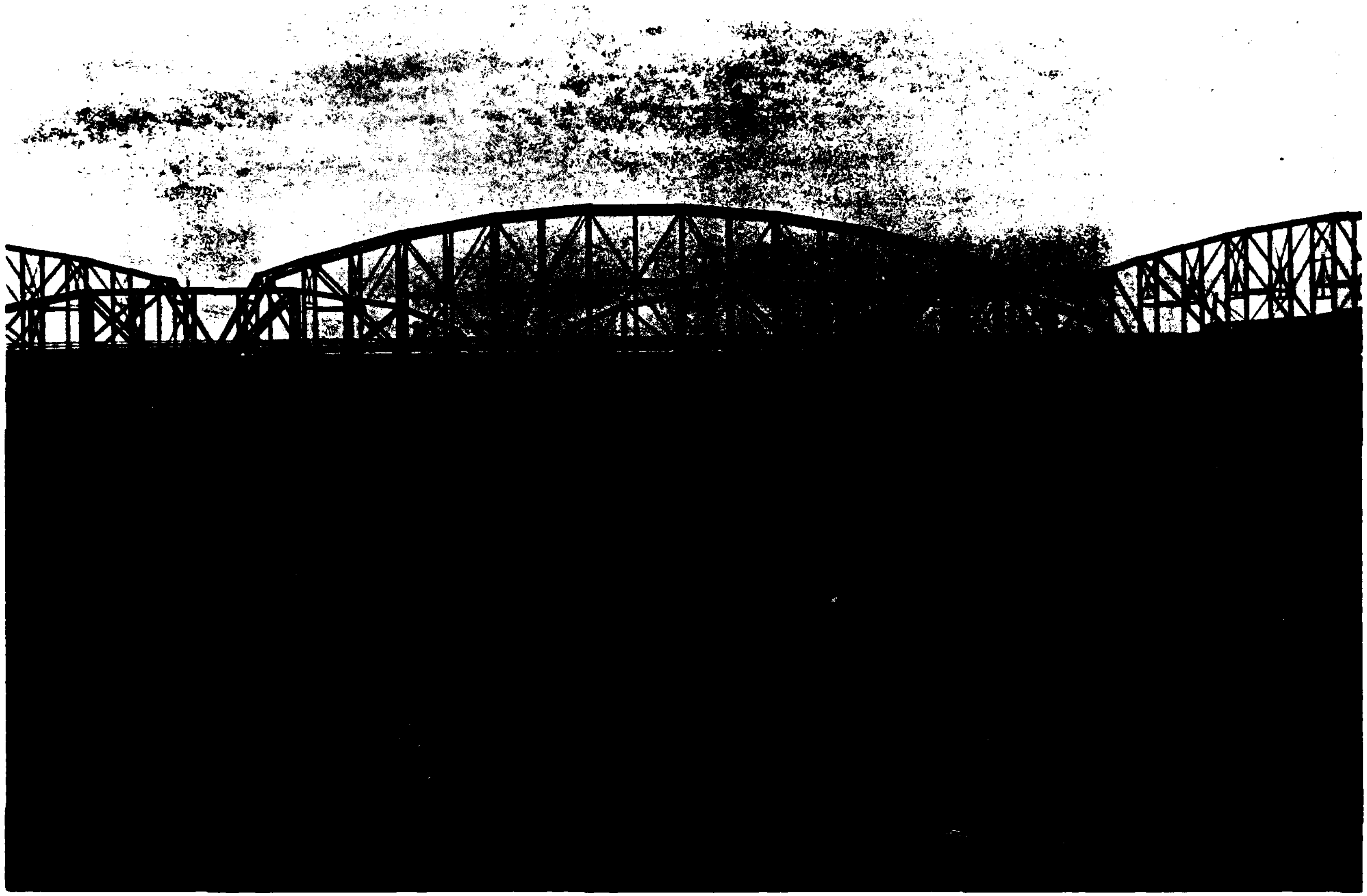

Figure 0-15. Old U. S. Highway 14 Bridge over the Missouri River at Pierre, South Dakota. Detail view of one of the channel spans, looking north. Photo: D. Murphy.

increased demands of auto traffic across the United States (Condit 1961:87). The vicinity had been served much earlier by a pontoon bridge but dependable service across the river had to await the completion of the Highway 14 structure in 1926 (South Dakota State Historical Society). This bridge now stands as one of several constructed across the Missouri in the early years of the National Highway program (nine bridges completed and one under construction between 1924 and 1926--Gee 1927).

The design of the structure is a fine example of bridges of its type and represents a late stage in the development of the simple fixed truss--a stage which was dominated by the complex subdivision of panels in the Pratt and Warren trusses (Condit 1961: 82, 1968:142-143). The relatively light loads and the nature of the design combined to allow the use of light members creating a bridge of some delicacy. The visual aesthetic distinction of the bridge is enhanced by its proximity to the 1907 Chicago and North Western Railway bridge. Particularly interesting is the view of both bridges while moving across the present highway span just a few hundred feet to the south.

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ARCHEOLOGICAL INVESTIGATIONS WITHIN FEDERAL LANDS LOCATED ON THE EAST BANK OF THE LAKE SHARPE PROJECT AREA, SOUTH DAKOTA: FINAL REPORT

V O L U M E I I I

A P P E N D I X 2

SCOPE-OF-WORK

Division of Archeological Research
Department of Anthropology
University of Nebraska
Lincoln

SCOPE-OF-WORK

CONTRACT NO. DACW 45-78-C -1036

ARTICLE I. CHARACTER AND EXTENT OF SERVICES

1. The work to be accomplished by the Contractor shall consist of a Cultural Resource Reconnaissance of Federal lands located on the left bank of the Big Bend/Lake Sharpe project lands in parts of Buffalo, Hyde, and Hughes Counties, South Dakota. This Cultural Resource Reconnaissance shall be accomplished in accordance with (a) the Antiquities Act of 1906 (Public Law 59-209), (b) the Historic Sites Act of 1935 (Public Law 74-292), (c) Preservation Act of 1966 (Public Law 89-655), (d) the National Environmental Policy Act of 1969 (Public Law 91-190), (e) Executive Order 11593 for the Protection and Enhancement of the Cultural Environment (13 May 1971, 36 C.F.R. 8921), (f) the Archeological Conservation Act of 1974 (Public Law 93-291), (g) the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Chapter VIII, Part 800), (h) National Register of Historic Places 1975 (F.R. 4 Feb 1975, Vol. 40, No. 24, published annually and supplemented on the first Tuesday of each month), (i) (ER) Engineering Regulation 10-1-3, (j) ER 37-2-10, Chapter 8, (k) ER 405-1-875, (l) ER 1105-2-507, (m) ER 1145-2-303 (33 C.F.R. 209.120), (n) TM 5-801-1, Historic Preservation, Administrative Procedures, and (o) National Register of Historic Places, 36 C.F.R., Part 60 (F.R. 9 Jan 1976, "Nominations by States and Federal Agencies"). A copy of these laws and regulations will be furnished upon request.

2. The Cultural Reconnaissance shall be limited to the Big Bend/Lake Sharpe project lands on the east bank of the reservoir, as delineated on the Boating and Recreation map, made a part of this contract as Exhibit A.

3. The Cultural Reconnaissance shall consist of (a) an exhaustive search and comprehensive review of existing literature and records, (b) a thorough field examination of 100 percent of the lands hereinbefore specified, to clearly establish from surface investigations and occasional test pits (as deemed necessary by the Contractor) the existence and location of cultural resources. From this, the Contractor will determine the necessity of subsequent surveys, testing, evaluation of cultural resources found, and nominations of resources to the National Register of Historic Places, (c) prepare in draft form necessary National Register Nomination forms, (d) prepare a comprehensive report as hereinafter specified, and (e) submit with the report a list of all artifacts collected.

a. Literature and Records Search. Cultural resources are defined as any building, site, district, structure, object, data, or material significant in history, architecture, archeology, or culture. Information and data for the literature search shall be obtained from, but not limited to, the following sources: (1) published and unpublished reports and documents such as books, journals, theses, dissertations, and manuscripts, (2) files and data in State Historic Preservation and/or Society Office, the Midwest Archeological Center in Lincoln of the National Parks Services, other Federal Agency field offices, and local historical societies, (3) consultations with any other qualified professionals known by the Contractor to have knowledge about cultural resources in the contract area, and (4) consultations with amateur archeologists and individuals knowledgeable of local history. The Contractor shall also include information regarding any cultural resources in the contract area that have been recorded and/or are being considered for nomination to the National Register of Historic Places in the reconnaissance report.

b. Field Examinations. The Contractor shall conduct a thorough on-the-ground reconnaissance of all Federal lands as hereinbefore specified. The Cultural Reconnaissance shall be of sufficient detail and intensity to clearly establish the existence, locations, and boundaries of cultural resources. The Contractor shall obtain sufficient evidence to provide for a "determination of significance" for resources found. The level of sufficient evidence, i.e., documentation, required is as described in Federal Register, Volume 41, No. 82, Part III, Tuesday, 27 April 1976.

(1) The field examination shall be conducted in close coordination with the contract administrator and the Big Bend Project Engineer. Survey sites shall be subject to periodic visits by Corps representatives, without prior notice. The Contractor shall not enter upon private property without prior knowledge of the Lake Francis Case Project Engineer and arrangement made in cooperation with the Government for securing rights-of-entry when required.

(2) If, during the course of this contract, the Contractor becomes aware of the imminent degradation, destruction, damage, or erosion of apparently significant cultural resources, the Contracting Officer shall be notified immediately and a determination will be made by the Government of any mitigative action to be taken.

(3) The Contractor shall keep clear, legible, standard, field records available, and current, for sporadic review by the Contracting Officer or representative. These records shall include, but not necessarily be limited to, field notebooks, site survey forms, field maps, National Register Nomination forms, and photographs. One copy of all field records shall be submitted as an appendix to the Cultural Reconnaissance Report at the completion of the contract.

(4) The Contractor shall pick up and retain only those surface artifacts necessary to the Contractor in assuring the cultural component or components in a particular site. All cultural data obtained as

a result of test pits will be retained. All artifacts retained shall be carefully washed, cataloged, recorded, and stored during the reconnaissance. The artifacts will be permanently stored and/or displayed after the contract period at a place, and in a manner, as determined by the Contracting Officer, and in accordance with ER 1105-2-460, paragraphs 10e(1) and (2).

c. National Register Nominations. The Contractor shall also fill out completely, in draft form, National Register Nominations for those sites and other resources which appear to qualify for the National Register of Historic Places. These forms shall be submitted to the Contracting Officer at least monthly throughout the life of the contract.

d. Cultural Reconnaissance Report. The Contractor shall prepare a Reconnaissance Report detailing the work done, the study rationale, the survey results, recommendations for additional work, if necessary, and appropriate mitigative measures, if required. The report shall include, but not be limited to the following sections: (1) abstract, (2) introduction, (3) regional location, (4) methodology, (5) evaluation discussion of previous work and inventory of cultural resources in the area, (6) mitigation required, (7) a concise, definitive summary with references, and (8) appendices as necessary. The abstract shall be a synopsis of the report stating the conclusions and recommendations. The introduction shall include, but not necessarily be limited to, a statement of purpose, delineation of the study boundary, and a general statement on the nature of the study. The regional setting of the project area, i.e., Missouri River Trench, should include a discussion of general environmental factors affecting cultural resource locations. The methodology description shall be of sufficient detail to describe surveying and sampling procedures, the data collected, artifacts retrieval procedures, recording and classification techniques, and chronological determination techniques. The methodology should also include maps of the areas tested, test pit locations, soil profiles, and any anomaly discussed in the report. The report shall contain a brief summary and evaluation of previous archeological and historical studies of the region, including the dates, extent and adequacy of past work as it reflects on the interpretation of what might be found in the project area. The report shall contain an inventory of all cultural resources in the project area. Information shall be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, and advantageous to communicate necessary information. The Contractor shall give every consideration to the use of non-textual forms of presentation, particularly profile (cross-section) drawings in combination with maps, to maximize the quantity and quality of information per page. All references cited and/or utilized shall be listed in standard American Anthropological Association format. Contracts with other individuals shall also be cited.

ARTICLE II. CHARACTER AND EXTENT OF CONTRACTOR'S QUALIFICATIONS.

1. The Contractor shall utilize interdisciplinary skills and knowledge as necessary to fulfill the requirements of this contract such as

archeology, history, historical archeology, architectural history, paleontology, botany, zoology, historical landscape architecture, and geology. All personnel shall be fully qualified, as hereinafter specified, or work under the direct supervision of persons fully qualified, as hereinafter specified. Professional qualifications shall be as specified by applicable professional standards in South Dakota and/or the following minimum standards, whichever are greater. In no case shall the designated Project Director, Crew Chiefs, and Field Assistants be less qualified than South Dakota standards and/or the following minimum standards for archeology, history, or architectural history, provides.

a. History. The minimum professional qualifications in history are a graduate degree in American History, or a bachelor's degree and one of the following: (a) two years full-time experience in research, writing, teaching, interpretation with an academic institution, historical organization or agency, museum or other professional institution; or (b) substantial contribution through research and publication to the body of scholarly knowledge in the field of history.

b. Archeology. The minimum professional qualifications in archeology are (a) a graduate degree in archeology, anthropology, or closely related field, or equivalent training accepted for accreditation purposes by the Society of Professional Archeologists, (b) demonstrated ability to carry research to completion evidenced by timely completion of theses, research reports, or similar documents, and (c) at least 16 months of professional experience and/or specialized training in an archeological field, laboratory, or library research, administration, or management, including at least 4 months experience in archeological field research and at least 1 year of experience and/or specialized training in history and the prehistory of the plains. Persons should have at least 1 year or its equivalent in field experience and/or specialized training in documentary research and should have at least 1 year of experience or specialized training in research concerning archeological resources of the prehistoric period. They should have had at least 1 year of experience in research concerning archeological resources of the historic period. Experience in archeological research in the region where the project will be undertaken is necessary.

c. Architectural History. The minimum professional qualifications in architectural history are a graduate degree in architectural history, historic preservation, or closely related field, with course work in American architectural history; or a bachelor's degree in architectural history, with a concentration in American architecture; or a bachelor's degree in architectural history, historic preservation or closely related field plus one of the following:

(1) At least 2 years full-time experience in research, writing, or teaching in American history or restoration architecture with an academic institution, historical organization or agency, museum or other professional institution; or

(2) Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

ARTICLE III. <u>REPORT SPECIFICATIONS</u>.

1. The report format shall be in accordance with ER 1105-2-403, dated 4 January 1974, Format and Appearance of Feasibility Report. The format will be furnished separately at time of contract award.

2. The Contractor shall submit six copies of the complete report, in draft form, with 267 calendar days after receipt of Notice to Proceed. The Government shall have a maximum of 60 calendar days to review the draft report. The Contractor shall have 28 calendar days to include the Government's review comments into the final report and submit the final original report, with all negatives, photographs, maps, charts, tables and standard drawings to the Government. The final report original shall be prepared on 8"x10½" bond paper, be single spaced, and be "camera ready".

3. Neither the Contractor nor any representative shall release, publish, discuss, or in any manner disseminate the report or the materials obtained in the preparation thereof under this contract without the prior written approval of the Contracting Officer.

PART II - SECTION H

<u>PERIOD OF PERFORMANCE</u>. The Contractor shall commence work within ten days following receipt of award of a contract and shall complete the work by 15 April 1979.

PART II - SECTION I

<u>INSPECTION AND ACCEPTANCE</u>. The Government may, at any reasonable time, inspect the progress of the work. Such inspection, however, shall not be performed in such a way as to unduly affect the progress of the work. Final acceptance of the work will be made upon successful completion of the work required under the contract.

AMENDMENT P00001

1. The Contractor shall conduct further evaluation of 10 (ten) sites. The evaluation shall consist of limited testing of the sites, analysis of the data obtained, and preparation of a report.

a. Field evaluation: The field evaluation shall consist of an expanded testing program for the 10 sites. These sites and the information which shall be obtained from them are identified in Table I.

b. Analysis: Will be conducted in the same manner as that done under the original contract.

c. Preparation of reports: All report format and specifications listed in the original contract shall be adhered to with the following exceptions:

Interim Report: This report shall be submitted in draft form on the originally designated contract date, 4 April 1979, and shall include the following items:

- Abstract
- Introduction and contract background
- Statement of study goals
- Methodology of study
- Historical background
- Historical cartography
- Archeological background
- 1978 field survey results
- Mitigation recommendations
- Appendices
  - Site survey forms
  - Map location forms
  - Excavation forms
  - Photo forms
  - Catalog forms
  - Site maps
  - Geomorphology reports
  - National Register Nomination forms

This report will contain all the basic data and recommendations for resource planning for 118 identified sites. It will also include information derived from the 1978 field work for the ten sites proposed for further work; no final recommendations or National Register Nominations will be included on these sites, however.

Six copies of the draft interim report shall be submitted on 4 April 1979. The Government shall have a maximum of 90 calendar days to review the draft interim report. The Contractor shall have 28 days to include the Government's review comments into the final Interim report and submit the final original report. The Interim report original shall be prepared on Government-furnished 8"x10½" bond paper and be camera ready.

Final Report: A final draft report shall be submitted on 30 April 1980. This report shall contain all data presented in the Interim report with any additions or deletions generated by the additional field investigations and laboratory analysis. In addition it shall contain the following added sections:

- Technical reports for the 10 sites investigated
- Ceramic seriation study
- Lithic use study

Faunal study
Final geomorphology studies
Final resource recommendations and recommended management plan
Final National Register Nomination forms

Six copies of the final draft report shall be submitted on 30 April 1979. The Government shall have a maximum of 90 calendar days to review the final draft report. The Contractor shall have 28 days to include the Government's review comments into the final report and submit the final original report, with all negatives, photographs, maps, charts, tables, and standard drawings to the Government. The final report original shall be prepared on Government-furnished 8"x10½" bond paper and be "camera ready".

2. Meetings: Two meetings shall be held between the Contractor and the Government. The first meeting shall be held at the University of Nebraska, upon completion of the fieldwork. The purpose of the meeting shall be to review the results of the field investigations.

The second meeting shall be held in Omaha, Nebraska at the Omaha District Office of the U.S. Army Corps of Engineers, upon completion of the Government review of the draft of the final report. The purpose of this meeting shall be to discuss the Government's comments prior to their incorporation in the final report.

3. Reproduction: The Government shall provide reproduction services for all major maps and plates for the 6 copies of each draft report.

Table 1. Cultural Resources Located on the East Bank of Lake Sharpe Which Need Further Testing.

Site Number	Scope of Testing Needed		
	Size of Site	National Register Quality	Culture Represented
39HU115		Need	Need
39HU102	Need	Need	Need
39HU243	Need	Need	Need
39HU242		Need	Need
39HU221		Need	Need
39HU88		Need	
39HU89	Need	Need	Need
39BF42		Need	Need
39BF41	Need	Need	Need
39BF238	Need	Need	

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